



**SEA AND INLAND
FISHERIES
REPORT FOR
1970**

AN ROINN TALMHAIOCHTA AGUS IASCAIGH
(Department of Agriculture and Fisheries)
FO-ROINN IASCAIGH
(Fisheries Division)

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REPORT
 OF THE
MINISTER FOR AGRICULTURE AND FISHERIES
 ON THE
SEA AND INLAND FISHERIES
 FOR THE YEAR
1970.

PART I

SEA FISHERIES

1970 was another record year for sea-fish landings, the value of which at £3,911,464 was £915,914 or 31% above the figure for 1969. The biggest increase was in the value of the landings of pelagic fish which rose from £851,117 to £1,381,030. Next came shellfish landings which rose from £890,548 to £1,102,071 while the value of demersal fish landed rose from £1,253,885 to £1,428,363.

The weights and values of annual landings of sea-fish (excluding shellfish) since 1961 are set out in the following table :

TABLE 1

Year		Cwt.	£
1970	...	1,325,129	2,809,393
1969	...	1,074,922	2,105,002
1968	...	836,156	1,668,751
1967	...	833,649	1,636,149
1966	...	626,316	1,454,175
1965	...	562,677	1,269,111
1964	...	487,871	1,084,442
1963	...	399,280	1,059,827
1962	...	441,149	1,169,201
1961	...	516,207	1,079,556

Details of quantities and values of the several varieties of sea-fish and shellfish landed in 1969 and 1970 are given in Appendix No. 1. The average price per cwt. obtained for each variety of sea-fish (other than shellfish) from 1963 onwards is shown in Appendix No. 2.

Small imports of white fish, mainly plaice, were, as in previous years, permitted when supplies from home landings fell short of home market demand.

The leading fishing ports in 1970 in order of value of fish landed were: Killybegs, Dunmore East, Howth, Cobh, Castletownbere, Kilmore Quay and Galway/Aran Islands. As compared with the corresponding order of importance in 1969 there was no change in the first five places. Kilmore Quay and Galway/Aran Islands, however, moved into sixth and seventh places respectively replacing Dun Laoghaire and Skerries in those positions.

DEMERSAL FISHERY.—The total landings (301,974 cwt.) fell slightly in comparison with the total for 1969. The main decreases were in landings of whiting which fell by 19,688 cwt., of other round fish which fell by 10,612 cwt. and of plaice which fell by 5,706 cwt. The principal increase was in the haddock catch which rose by 20,241 cwt. Whiting still remained the variety caught in greatest quantity and was followed by haddock, cod, plaice and ray/skate in that order.

While the total quantity of the demersal landings fell by 4%, the total value of the landings increased by 14%—from £1,253,885 in 1969 to £1,428,363 in 1970. All varieties, with the exception of hake, showed increases in average prices. Plaice continued to be first in terms of cash earnings and was followed by cod, haddock and whiting. Thus haddock exchanged places with whiting as compared with 1969. These four varieties contributed 70% of the total value of demersal landings. They were followed in order of value by ray/skate, soles and pollack which was the same order as in 1969.

The weights, total value and average value of landings of demersal fish over the past ten years are shown in the following table:

TABLE 2

Year	Quantity	Value	Average Value per cwt.
	cwt.	£	£
1970	301,974	1,428,363	4.73
1969	314,470	1,253,885	3.99
1968	313,241	1,111,747	3.55
1967	313,438	1,079,794	3.45
1966	272,491	995,703	3.65
1965	282,192	959,362	3.40
1964	267,155	876,310	3.28
1963	210,318	829,367	3.94
1962	230,110	866,547	3.77
1961	212,703	820,911	3.86

PELAGIC FISHERY.—The total pelagic catch was 1,023,155 cwt. which was 262,703 cwt. or 34% up on the figure for 1969. Landings of herrings and sprats again showed increases while landings of mackerel continued to fall. The total value of the catch was £1,381,030

representing an increase of 62%. All pelagic varieties showed an increase in the average landed price per cwt.

Herrings:—The 1969/70 herring season off the south-east coast continued up to 25th February, 1970. Landings from the fishery for the months of January and February, 1970 amounted to 185,000 cwt. which was also the amount landed in the corresponding period of 1969. As a result, however, of exceptionally heavy fishing in December, 1969 the total landings for the 1969/70 season reached 339,000 cwt. which was the highest figure on record. Seventy-three boats took part in the fishery and landings were again mostly made by paired mid-water trawls and bottom trawls. The 1970/71 season opened in the middle of November and very good catches were made in both November and December. Landings during this period amounted to 272,000 cwt. as compared with 154,000 cwt. and 62,000 cwt. in the corresponding periods of 1969 and 1968 respectively. As in previous seasons catches were again located over a wide area with all the landings being made at Dunmore East and Cobh. Total landings of herrings from the fishery for the year 1970 amounted to 457,000 cwt. as compared with 339,000 cwt. in 1969 and 182,000 cwt. in 1968. Despite this substantial increase in landings, demand continued to be buoyant and the average price realised was greater than in previous years.

The 1969/70 winter herring season off the Donegal, Sligo and North Mayo coasts continued until early February, 1970. Landings of herrings were also made from March to September 1970 and during this period 74,000 cwt. were landed. The 1970/71 winter season commenced in early October, 1970. Owing to poor fishing in parts of the fishery, landings for the period October to December, 1970 were slightly lower than for the corresponding period in 1969. Landings were made at Killybegs, Sligo and Burtonport. Total landings in 1970 from the fishery were 233,000 cwt. as compared with 234,000 cwt. in 1969 and 264,000 cwt. in 1968. As in the case of the south coast, demand continued to be buoyant.

A small fishery developed in Galway Bay from November, 1970 and landings of herrings amounting to 25,000 cwt. had been made at Galway and Rossaveel by the end of the year.

Catches of herrings were also made in the Irish Sea particularly during January and December. A high proportion of the catch was landed at Mornington for conversion to fishmeal and fish oil.

The small autumn fishery off the south-west coast began early in September and lasted until the end of October. Poor weather restricted fishing but, nevertheless, landings at 20,300 cwt. were nearly double the figure for 1969.

Most of the herring catch is exported in fresh or processed form and the increased landings in 1970 resulted in greatly increased export returns. Exports of fresh, chilled or frozen herring amounted to 258,404 cwt. valued at £618,031 as compared with 181,636 cwt. valued

at £292,822 in 1969. The quantity of exports in cured and marinated forms was £294,281 cwt. as compared with 312,208 cwt. in 1969 while the value was £718,575 as compared with £582,599 in 1969.

The following table shows the quantity, total value and unit value of herrings landed in each of the past ten years.

TABLE 3

Year	Quantity	Value	Average Value per cwt.
	cwt.	£	£
1970 ...	894,677	1,275,442	1.43
1969 ...	682,238	783,973	1.15
1968 ...	452,160	496,753	1.10
1967 ...	465,606	499,280	1.07
1966 ...	293,300	399,312	1.36
1965 ...	210,555	251,521	1.20
1964 ...	160,929	155,440	0.97
1963 ...	165,696	193,068	1.17
1962 ...	187,534	260,463	1.39
1961 ...	250,078	209,710	0.84

Sprats:—Landings of sprats showed a spectacular increase, rising to 107,795 cwt. valued at £65,947 in 1970 from 46,413 cwt. valued at £21,792 in 1969 and 28,117 cwt. valued at £11,694 in 1968. Most of the catch was disposed of for fishmeal production.

Mackerel:—Landings of mackerel continued to decline—20,683 cwt. (£39,641) in 1970 as compared with 31,801 cwt. (£45,352) in 1969 and 42,590 cwt. (£48,526) in 1968. The average price was £1.92 per cwt. which was an increase of £0.49 on 1969.

The chief landing centres for mackerel were : Killybegs, Castletownbere, Dingle, Valentia/Cahirciveen, Howth and Mornington.

Statistics of mackerel landings over the past ten years are given in the following table :—

TABLE 4

Year	Quantity	Value	Average Value per cwt.
	cwt.	£	£
1970 ...	20,683	39,641	1.92
1969 ...	31,801	45,352	1.43
1968 ...	42,590	48,526	1.14
1967 ...	44,196	51,163	1.16
1966 ...	29,645	46,389	1.57
1965 ...	40,213	45,853	1.14
1964 ...	26,308	38,891	1.48
1963 ...	14,980	33,753	2.25
1962 ...	16,475	39,297	2.38
1961 ...	24,007	38,238	1.59

SHELLFISH.—The value of the shellfish catch exceeded £1 million for the first time. The new record figure of £1,102,071 represented an increase of £211,523 over 1969. The principal increases were in Dublin Bay prawns (+£106,091) and crawfish (+£57,589). The discovery and exploitation of beds of queen scallops in the Irish Sea increased the landings of this variety to 26,915 cwt. valued at £69,987. On the other hand, the quantities and values of lobsters and oysters declined somewhat. Unit prices for shellfish were generally higher than in 1969.

Values of shellfish landings over the past ten years were :

TABLE 5.

Year	£
1970 ...	1,102,071
1969 ...	890,548
1968 ...	735,030
1967 ...	516,623
1966 ...	579,161
1965 ...	431,262
1964 ...	420,114
1963 ...	353,863
1962 ...	329,794
1961 ...	277,686

EXPORTS.—At £4,600,669 exports of fish and fishery products, including both sea-fish products and freshwater fish products (see Part II of this Report) also established a new record. Exports of sea fish products at £3,354,792 were £959,935 up on 1969. Herrings and shellfish were mainly responsible for this spectacular increase. Details of the exports are given in Appendix No. 4.

PERSONNEL AND VESSELS.—The number of men engaged in sea fishing continued to increase in 1970. The number engaged full-time rose from 1,821 in 1969 to 1,964 in 1970 while the number of part-time fishermen rose from 3,810 to 3,897.

There was also an increase in the number of boats engaged in fishing in 1970, the total being 2,010 compared with 1,911 in 1969. The number of motor fishing vessels over 25 gross tons, which are responsible for most of the wet fish catch, rose from 210 in 1969 to 246 in 1970. There was also an increase in the number of motor vessels of 25 gross tons and under which rose from 645 in 1969 to 689 in 1970.

Further details are given in Appendix No. 7.

TRAINING OF FISHERMEN.—The scheme for training boys as fishermen was continued in 1970. The period of training extends over twelve months, five months of which are spent at a shore course

provided in temporary school premises at Moville, Co. Donegal, and for the remainder of the period practical fishing experience is acquired by the trainees working aboard selected fishing vessels. A group of twenty-two boys commenced training under the scheme on 1st February, 1970 and at the end of the year were completing the practical side of the course. A second group of twenty-seven boys commenced their training at Moville on 1st September, 1970 and the course was still in progress at the end of the year.

Six fishermen were selected to participate in the shore course provided in co-operation with the Galway Vocational Education Committee towards equipping experienced fishermen to qualify as skippers and five of them were subsequently successful in obtaining Certificates of Competency under the Merchant Shipping Acts. Since its inception in 1958 the scheme has assisted 92 fishermen in obtaining their certificates. For fishermen who do not find the Galway course convenient, An Bord Iascaigh Mhara continued in 1970 to provide port courses at selected centres and, as a result, Certificates of Competency under the Merchant Shipping Acts were awarded to a further 11 fishermen.

AN BORD IASCAIGH MHARA.—The Board received from the Fisheries Vote, 1969/70, a grant of £628,000 in aid of current and capital development and administration. Repayable advances totalling £181,000 were also made to the Board from the Central Fund mainly for the provision of boats and gear.

The Board pursued an intensive programme of market research and investigation abroad aimed at assisting exporters not alone to increase the volume of exports of shellfish and sea-fish products but also to diversify market outlets and maximise returns for an expanded range of products.

New export developments were particularly significant in the case of herring products and new market outlets were found in the Scandinavian countries, Belgium and Western Germany for various forms of processed herring. Recently established shellfish processing factories contributed substantially to increased exports of shellfish products including processed mussels and crabmeat. There was a marked increase in the number of exporters who qualified for grant assistance under the Board's Travel Incentive Scheme, to encourage more visits by exporters to overseas markets. During 1970 the value of the fishery exports increased to £3½ million.

The Board's programme for the provision of ice-making facilities was almost completed during the year with the installation of new equipment in the ice plant at Galway.

During the financial year ended 31st March, 1970 the Board assisted Irish fishermen in acquiring 54 new and 6 second-hand boats. Advisers on industrial fishing techniques and the operation of electronic equipment were employed by the Board in its programme for

technical education. The Board also organised study tours abroad for groups of Irish fishermen.

The continued growth of fishery co-operatives and the expansion of existing co-operatives was assisted by the Co-operative and Small Business Grants Scheme. A new development was the organisation of a series of life-saving and fire-fighting demonstrations for the benefit of fishermen in major ports.

SEA FISHERIES PROTECTION.—Protection of the exclusive fishery limits involving regular patrols by vessels of the Naval Service of the Department of Defence was maintained in 1970. Prosecutions were instituted against the skippers of six foreign vessels who had been arrested for illegally entering and fishing inside our exclusive fishery limits. Convictions on both counts were secured in five cases resulting in fines and forfeiture of fish and gear. In the sixth case the skipper was convicted of illegal entry only and a fine was imposed. In the conduct of these cases and in the enforcement of fishery protection measures generally, the co-operation of the Garda Síochána was readily available.

EXPLORATORY VESSELS.—During the year the Department's exploratory fishing vessels, *Cú Feasa* and *Cú na Mara*, continued to assist in a variety of fishery research projects, including experimental fishing for nephrops, scallops, mussels, lobsters and crawfish. Exploratory fishing for herring off the West coast was carried out by the *Cú Feasa* and *Cú na Mara* working jointly. Both vessels engaged in industrial fishing involving search operations and the testing of the economics of various types of trawling.

MARINE WORKS.—Development work was continued on the major fishery harbour schemes at Killybegs, Castletownbere and Dunmore East.

On 23rd March, 1970, the Minister made an Order under the Fishery Harbour Centres Act, 1968 (No. 18 of 1968) declaring and defining the area of the Castletownbere Fishery Harbour Centre. The Order, which came into force on the 1st April, 1970, transferred to the Minister all the property, rights and liabilities of the Cork County Council in its capacity as managing authority for Castletownbere Harbour. During the year compulsory acquisition proceedings were instituted, under Section 3 of the Act, to acquire certain lands and rights which are necessary to enable the planned development works to be proceeded with at this Fishery Harbour Centre.

On 28th April, 1970, the Minister made an Order under the Fishery Harbour Centres Act, 1968 extending the application of the Killybegs Pier and Harbour Order, 1896, including the rates specified in the Schedule to that Order, to the whole of the Killybegs Fishery Harbour Centre as declared and defined by the Fishery Harbour Centre (Killybegs) Order, 1969 (S.I. No. 210 of 1969).

Improvement works in the fisheries interests were completed during the year at Brandon Creek, Dooneen, Renard Point, Co. Kerry; Kilkieran and Kilronan, Co. Galway; and a boring survey at Burtonport, Co. Donegal.

A substantial harbour improvement scheme at Skerries, Co. Dublin, was nearing completion at the end of the year and harbour improvement schemes were in progress at Kilmore Quay, Co. Wexford; Reen Pier, Co. Cork; Fenit, Cromane and Cuas Baile Mór Thoir, Co. Kerry; Bealcarra and Glinsk, Co. Galway; Killala and Darby's Point, Co. Mayo; and at Rannagh and Poolawaddy, Co. Donegal.

Work was also in progress during the year on the erection of navigation lights at Tullaghan Bay and Achill Sound, Co. Mayo and approval was given for the erection of navigation lights at Cora Pointe, Aran, Co. Galway; Bone Rock, Killala, Co. Mayo; Poolaheeney, Co. Sligo and in Owey Sound, Co. Donegal.

Improvement works were approved for Rossaveel, Cleggan, Emlaghmore, Roundstone, Furnais North, Coolacloy, Sruffaun and Sruthán Buí, Co. Galway; Porturlin, Caladh Mhagnuis, Blacksod Quay, Dooega, Portahaulia, Co. Mayo; and at Teelin, Port an Dhuín, Port an Ghlais, Ballysaggart, Magheraroarty, Moville and Ballyhoorisky, Co. Donegal. Approval was also given for the carrying out of boring surveys as a requisite preliminary to improvement works proposed for Reen (Ballinskelligs), Portmagee and Cahirciveen, Co. Kerry.

The survey team set up to make an appraisal of the landing facilities required to meet the present and expected needs of the fishing industry on the Clare Coast completed its task. A similar survey of the Cork coast was commenced during the year.

EUROPEAN ECONOMIC COMMUNITY.—Negotiations on Ireland's application for membership of the EEC together with those of Britain, Denmark and Norway opened in Luxembourg on 30th June, 1970, and continued into 1971.

In June, 1970, the Community adopted a common policy in the fisheries sector and embodied it in two main regulations made in October, 1970 providing for (a) a common structural policy and (b) a common organisation of markets. The structural regulations provide, *inter alia*, that fishing vessels flying the flag of a Member State and registered in Community territory would have equal access to and exploitation of the fishing grounds situated in maritime waters under the sovereignty or jurisdiction of Member States. There is provision for a limited derogation from this arrangement in respect of certain fishing areas in favour of the local population where the latter is mainly dependent on coastal fishing. The regulations also provide for possible restriction of certain types of fishing in certain areas and at specified times in the interests of conservation of fish stocks. Community financing will be available for such projects as fisheries research, improvement of fishing fleets and modernisation of storage and processing facilities.

The marketing regulation covers all categories of fish and fishery products. Under it, provision is made for the establishment of producer organisations whose chief functions will be to adapt supplies of fish to market requirements and to operate support price arrangements. Guide and withdrawal prices will be fixed annually for named species of fish complying with specified standards. Market intervention by the producer organisations is provided for when market prices fall to the withdrawal price level. The producer organisations may be granted aids for their establishment and to meet part of the cost of market intervention measures. All restrictions in trade between Member countries will be removed. Imports from non-member countries into the Community will be subject to a common customs tariff which will be operated in conjunction with a reference price and levy arrangement in regard to those species of fish for which guide prices are fixed.

In the negotiations for Ireland's entry into the EEC strong concern was expressed as to the adverse affects on the Irish fishing industry of the implementation of the Community's policy of common access to our fishery waters. This question was still the subject of negotiation at the end of the year.

SCIENTIFIC INVESTIGATIONS.—Full details of the investigations carried out by the Department's staff have already been published in *Sea Fisheries Bulletin* (No. 8). Eight *Fishery Leaflets* on marine topics were published during the year. A full list of the publications is given on page 66.

Data on catch and effort from the lobster fishery, provided by fishermen, were analysed during the year and a further census of the types of lobster boats and their fishing gear was also undertaken. A *Fishery Leaflet* giving the results obtained was in an advanced state of preparation at the close of the year under review. Research on the crawfish (*Palinurus elephas*) was confined to the analysis of catch and effort, some preliminary gear trials and investigation of a shell disease first noted in the autumn of 1970. A cruise by the research vessel *Cú na Mara* off the south-west coast during August, 1970 using special gear to fish in deep water for crawfish gave disappointing results probably because special handling problems needed to be overcome before the gear could be operated efficiently.

Work was continued during the year on the Dublin Bay Prawn (*Nephrops norvegicus*). Research trawl, commercial sampling and tin-tow-net hauls were made and rearing of larvae was undertaken in the laboratory. The effect of light on the catchability of prawns was also investigated during the year.

Research into the development of oyster stocks at Tralee Bay, Co. Kerry and Clarinbridge, Co. Galway was continued during the year. Spatfall in Tralee Bay was poor because of the low temperatures prevailing. The various hydrographical and biological factors governing the success of native oysters in Tralee Bay were also investigated

with a view to increasing output from the public beds. In conjunction with a number of private oyster fisheries, research into the improved techniques for farming was continued. Special attention was given to the farming of Norwegian flat oysters in Cork Harbour.

Development and research work was continued on the more important mussel fisheries around the coasts, which have benefitted from programmed relaying of young mussels to areas of good growth and fattening potential. Tests on raft culture of mussels indicate that, under some circumstances, this method may be successful from the economic point of view. Further tests were made of the effectiveness of transferring small mussels from an open sea area along the east coast to Wexford Harbour in order to augment the local stock. In connection with the mussel fisheries a survey was made of possible sources of pollution in the estuaries of several Irish rivers.

Investigations of the scallop stocks around the Irish coasts were continued throughout the year. As a result of trial dredgings from the research vessel *Cú na Mara* for scallops off the east coast near Dublin in the autumn of 1970, dense stocks of the "queen" or queen scallop (*Chlamys opercularis*) were discovered and these soon became the subject of an intensive fishery by local fishing boats.

For the second successive year, the American Hard Shell Clam (*Mercenaria mercenaria*) comprising second-generation disease free stocks from the Ministry of Agriculture, Fisheries and Food's hatchery at Conway, North Wales, was introduced into certain selected localities in Ireland. The growth and development of the plantings were kept under observation throughout the year.

Investigations into the herring stocks on the south, south-west, west and north-west coasts were carried on during the year. Reports on the stocks of herrings on south and north-west coasts were circulated to the trade as usual. One of the Assistant Inspectors presented two papers—one on herring spawning behaviour and the other on the infestation of Irish herrings with parasites—to the Pelagic Fish (Northern) Committee of the International Council for the Exploration of the Sea at its meeting in Copenhagen in September, 1970. The fat content of herrings from selected areas was also determined and the results made available to merchants, etc.

During the year considerable progress was made in the preparation of a paper describing the research vessel investigations on whiting which had been undertaken earlier. Further investigations were made into the distribution of plaice eggs and larvae in the Irish Sea and analysis of the results from the researches during the previous five years was being undertaken at the close of the period under review.

Young herrings taken in the Irish Sea for reduction to fish meal were also examined during the year. Cruises by the *Cú Feasa* in April and July, the first to determine the abundance of young herring off the south coast and the second to locate stocks of fat summer herrings off the north Donegal coast were severely hampered by a

number of difficulties and yielded little information. A joint cruise of the *Cú na Mara* and *Cú Feasa* in an effort to locate shoals of herrings in November/December off the west coast using paired mid-water Larsen trawls proved successful and resulted in fairly substantial landings of herrings at Galway.

Studies on the toxicity of certain detergents used to combat oil pollution were continued throughout the year. A Junior Fellow was appointed by the Department to make a survey of the fauna and flora of Bantry Bay, the cost of this work being borne by Gulf Oil Co. Ltd.

Samples of fish landed for industrial purposes on the east coast were examined to determine the amount of young fish of "protected" species present in the catches.

A number of rare or interesting species of fish were recorded from Irish waters in 1970 as follows:—

- i. Six-gilled shark (*Hexanchus griseus*)
- ii. Undulate ray (*Raia undulata*)
- iii. Painted ray (*Raia microcellata*)
- iv. White skate (*Raia alba*)
- v. Great silver smelt (*Argentina silus*)
- vi. Lesser fork-beard (*Raniceps raninus*)
- vii. Deal-fish (*Trachipterus arcticus*)
- viii. Boar-fish (*Capros aper*)
- ix. Pilot-fish (*Naucrates ductor*)
- x. Ray's bream (*Brama brama*)
- xi. Black bream (*Spondylusoma cantharus*)
- xii. Red-band or red-snake-fish (*Cepola rubescens*)
- xiii. Greater weaver (*Trachinus draco*)
- xiv. Spanish mackerel (*Scomber colis*)
- xv. Bonito (*Sarda sarda*)
- xvi. Blackfish (*Centrolophus niger*)
- xvii. Streaked gurnard (*Trigloporus lastoviza*)
- xviii. File or trigger-fish (*Balistes carolinensis*).

During the year officers of the Department identified specimens of fish in relation to claims for "specimen" status for the Irish Specimen Fish Committee. Two persons from the scientific staff of the Department are members of this Committee.

ENGINEERING

Fishing Ports and Landing Places:—In continuation of the arrangements made to make an appraisal of the landing facilities required to meet the present and expected needs of the fishing industry, a further Survey Team was set up to examine and make recommendations on fishing ports and landing places in Counties Clare and Cork. The Clare survey commenced in January, 1970 and was completed and the report submitted in July, 1970. The Cork survey commenced in June and was still in progress at the end of the year. These teams acted under the chairmanship of Mr. S. Ó Mealláin, Consultant to the Department. Membership of the teams also consisted of a representative from each of the following bodies, viz. Department of Agriculture and Fisheries, Office of Public Works, Roinn na Gaeltachta (for Cork), the County Council of the County concerned, Bord Fáilte and An Bord Iascaigh Mhara.

Bye-laws, Licences, Orders and Definitions:—Maps were prepared in connection with various bye-laws, orders, licences and other Statutory Instruments.

Surveys were carried out of the boundaries of two oyster beds, one in the Clarinbridge and the other in the New Quay area, Co. Galway.

Marine Pollution:—Proposals for a number of major industrial projects involving the discharge of large quantities of effluent into tidal estuaries were investigated in the interest of the preservation of fish life and requirements were specified to ensure this. In particular, the water quality monitoring survey of Cork Harbour area was continued this year. Two surveys, one in April and the second in September, were carried out by a team on which were representatives of Fisheries Division of the Department of Agriculture and Fisheries and Messrs. Pfizer. The team was augmented in September by representatives of Cork Corporation.

The presence of the Ocean Survey vessel, HMS Hecate, in Bantry Bay was availed of, by kind permission of the Commander, for the Department's Senior Surveyor (Hydrographic) to visit and observe the hydrographic survey procedure followed.

TECHNOLOGY

Fish Quality Regulations:—The Fish Quality Officers were active in ensuring compliance with the Demersal Fish (Handling, Storage and Transport) Regulations, 1967. As in former years, the approach adopted was one of encouraging the fishermen and fish trade to comply with the Regulations but, in twelve cases, it was found necessary to institute legal proceedings. Convictions were secured in eleven of these cases, the remaining one not having been heard by the end of the year. Convictions were also secured in four cases commenced in the previous year. The improvement in the quality of fish, both delivered at the market and exhibited for sale in the retail shops, noted in the previous year was again evident in the year under review. In particular, the requirement of icing of the fish was seen in general to be well complied with.

Standards for Fishery Products:—The Inspector and Engineer continued to act as Chairman of a Working Group comprising representatives of the Department of Agriculture and Fisheries, An Bord Iascaigh Mhara, the Institute for Industrial Research and Standards and members of the Fish Trade, to advise the Institute for Industrial Research and Standards on the formulation of Standards for fishery products.

National Codex Alimentarius Committee:—This Committee established a Sub-Committee on Fish and Fishery Products and the Inspector and Engineer was appointed Chairman. The Committee comprises representatives of the Institute for Industrial Research and Standards, An Bord Iascaigh Mhara, the State Laboratory and the Confederation of Irish Industry.

Electrified Nephrops Trawl:—It was not possible to fit the sea trials proposed for the electrified nephrops trawl into the time available in the operation of the research vessels. However, sea conditions were simulated in specially constructed ponds big enough to hold full scale fishing electrodes. As a result, a number of improvements of design and mounting were made which promised to increase the efficiency of the equipment.

Preliminary experiments were carried out on a design for a fish pump with no moving parts.

INTERNATIONAL AND OTHER CONFERENCES

(1) *INTERNATIONAL COUNCIL FOR THE EXPLORATION OF THE SEA:*—The Department's Inspector and Scientific Adviser and the Inspector of Fisheries on the marine side attended the annual meeting of this Council held in Copenhagen, Denmark from 28th September until 7th October, 1970. They also attended a symposium in advance of the main meeting on methods of measuring catch and effort. The Department's Inspector of Fisheries on the marine side continued to hold office as Chairman of the Shellfish and Benthos Committee. He prepared for this Committee a bibliography of the papers published by participating countries in the shellfish and benthos fields. One of the Department's Assistant Inspectors of Fisheries contributed two papers to the Pelagic Fish (Northern) Committee on the spawning behaviour of herring on the south coast of Ireland and the infestation of Irish herrings by parasitic nematode worms.

(2) *NORTH-EAST ATLANTIC FISHERIES COMMISSION:*—This Commission, established under the terms of the International Fisheries Convention of London of 1959, held its eighth meeting in London in May, 1970. Ireland was represented on the occasion, as usual, by the Assistant Secretary in charge of Fisheries and the Inspector and Scientific Adviser, who is Vice Chairman of the Commission's Regional Committee 2 and of the Standing Committee on Infractions.

The Commission passed a number of conservation measures, including restrictions on the fishing for salmon on the high seas. One of the Assistant Inspectors of Fisheries attended a meeting of the ad hoc Study Group set up by the Commission on North Sea herring in The Hague in January, 1970 and this country's two Commissioners attended a similar meeting in London in May.

Ireland acted as host to a meeting of the ad hoc Study Group on Celtic Sea herring held in Dublin in December under the chairmanship of the Assistant Secretary in charge of Fisheries.

(3) **FAO TECHNICAL CONFERENCE ON MARINE POLLUTION AND ITS EFFECTS ON LIVING RESOURCES AND FISHING:**—This conference, organised by the Food and Agriculture Organisation of the United Nations, took place in Rome from 9th to 18th December, 1970. It was attended by one of the Assistant Inspectors of Fisheries who read a paper on "Toxicity of crude oil and detergents to two species of edible molluscs under artificial tidal conditions".

(4) **CHALLENGER SOCIETY:**—This Society which was founded to encourage the study of oceanography in its widest sense, organises a series of meetings each year. A number of the Assistant Inspectors of Fisheries on the marine side attended one of these meetings held in Belfast in September, 1970, and one read a paper on his work on the Dublin Bay Prawn (*Nephrops norvegicus*).

(5) **MARINE LABORATORIES IN CANADA AND UNITED STATES:**—During his visit in February, 1970 to Canada and the United States at the invitation of the Atlantic Salmon Association, the Department's Inspector and Scientific Adviser visited the Boothbay Harbour and Woodshole Laboratories of the U.S.A. Bureau of Commercial Fisheries, St. Andrew (New Brunswick) and St. John's (Newfoundland) Laboratories of the Fisheries Research Board for Canada and the Marine Laboratory at Logy Bay run by the Biology Department of the Memorial University of Newfoundland. At these laboratories he gave talks on Irish fishing and fisheries research.

(6) **MARINE SCIENCE ASSOCIATION OF IRELAND:**—Members of the scientific staff gave accounts of their research work at a meeting of this informal association which was held in Trinity College, Dublin, in April, 1970.

(7) **EUROPEAN CONSERVATION YEAR, 1970:**—Scientific and engineering members of the staff of the Department gave a series of lectures on the conservation aspects of their work at a seminar held at Howth, Co. Dublin, in October and a number also took part in a series of lectures in Waterford, Cork, Galway and Sligo. One of the Assistant Inspectors of Fisheries acted as the Department's fishery representative on the National Committee set up by the Minister for Lands to organise the Irish contribution to European Conservation Year, 1970

and took an active part in the educational programme. The Department's Inspector and Scientific Adviser took part in a symposium organised by the Royal Dublin Society in April, 1970.

(8) **CODEX ALIMENTARIUS COMMITTEE ON FISH AND FISHERY PRODUCTS:**—The Department's Inspector and Engineer attended as a delegate the meeting of the Committee on Fish and Fishery Products of the Codex Alimentarius Commission at Bergen, Norway, in October, 1970 in connection with the preparation of draft Standards for various fishery products.

(9) **FAO TECHNICAL CONFERENCE ON FISH FINDING, PURSE SEINING AND AIM TRAWLING:**—One of the Department's Fisheries Engineers and the Department's Inspector of Fisheries on the marine side attended the Conference held in Reykjavik, Iceland, at which developments and trends in fishing technology were dealt with.

(10) **ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT:**—The Department continued to participate in the work of the Fisheries Committee of this Organisation and was represented by administrative personnel at meetings held in Paris in May and November, 1970. The work of the Committee includes an extremely informative annual review of fisheries in member countries.

LEGISLATION.—The Sea Fisheries (Amendment) Act, 1970 (No. 8 of 1970) was enacted during the year. Its purpose was to—

- (a) increase from three million to five million pounds the maximum advances from the Central Fund to An Bord Iascaigh Mhara, this maximum to relate to the aggregate at any one time of advances outstanding and
- (b) enable An Bord Iascaigh Mhara to borrow for capital as well as for current purposes.

Particulars of Statutory Instruments relating to sea fisheries made during the year are included in Appendix No. 22.

PART II

INLAND FISHERIES

In 1970, the catch of salmon and grilse by all methods amounted to 3,510,748 lb. valued at £1,228,762 compared with 3,403,849 lb. valued at £1,107,788 for the preceding year. This is the highest catch recorded since the collection of statistics was started in 1927. The total number of salmon taken by all methods was 496,597 compared with 484,186 in 1969. In view of the continuing lack of the earlier running and heavier fish in 1970, the overall average weight at 7.07 lb. compared with 7.03 lb. in 1969 was due to the high average weight of the grilse component in the catches. Weather conditions for the second year running favoured netting during the main grilse run but angling was again adversely affected by the drought conditions which prevailed throughout a considerable part of the season. The rod catch in consequence was low amounting to 17,890 fish weighing 136,849 lb. and valued at £47,895 compared with 23,815 fish weighing 182,248 lb. and valued at £60,786 in the previous year. The catch of sea trout amounting to 106,951 lb. and valued at £26,738 was down on that for 1969 when the comparable figures were 127,272 lb. valued at £23,864. Full details of the catches of salmon and sea trout taken in the years 1968 to 1970 inclusive are given in Appendix 11. The catches made in that part of the Foyle Fisheries Commission area, formerly comprising the Merville Fishery District, are not included in Appendix 11.

Many Irish rivers were very low in the summer period due to prolonged drought which in some areas extended for many weeks. As a direct consequence of this, the rod and line catch was low as stated earlier. Reports indicate that spawning in most areas was generally not unsatisfactory.

Appendix No. 12 gives the catch of salmon and grilse for each Fishery District for the three years 1968, 1969 and 1970 inclusive. The catch of salmon in 1970 (by weight) was distributed as follows:—

Drift nets	...	49.3%
Draft nets	...	35.9%
Stake nets and other commercial methods	...	10.9%
Rod and line	...	3.9%

The proportion of fish taken by drift nets in 1970 was the same as in 1969, which was the highest on record.

The total number of angling licences for salmon and sea-trout was 11,446, a rise of 700 on 1969, despite the poor angling conditions. The average catch of salmon or grilse per licence was 1.6 fish weighing 12.16 lb. and valued at £4.56 which was well below those in the period 1967 to 1969. The rod-caught average at 7.6 lb. was a little lower than in 1969. The highest average weights of the rod catch were made in the Dublin (9.8 lb.) and Drogheda (9.6 lb.) Fishery Districts in which few grilse are ever taken on rod and line, most of the catch being made up of small spring and small summer fish (2 and 2+ sea

winters) which run early in the season. In the West of Ireland, however, because of the almost total reliance on grilse, the average weight as usual was low.

The sea trout catch of 106,951 lb. was distributed as follows:—

Rod and line	...	56.7%
Draft nets	...	37.7%
Drift nets	...	4.8%
Other commercial methods	...	0.8%

It should again be pointed out that generally there is little commercial fishing for sea trout. Most sea trout taken in nets etc. are captured as a bye-catch of salmon fishing.

The actual weight of the catch of sea trout on rod and line was 60,650 lb. or somewhat less than in 1969 when the catch by this method was 71,555 lb. As explained in previous reports the average catch of sea trout per licence gives a poor indication of the abundance of this species in the different fishery districts because, in many areas, only a few anglers out of all licensed to fish for salmon and sea trout do actually and specifically fish for sea trout.

The Corporation of Dublin Wholesale Fish Market handled in 1970 118,756 salmon and grilse weighing 863,039 lb. as compared with 156,131 fish weighing 1,103,368 lb. in 1969. In 1970, this market handled 24% by number and 25% by weight of all the fish taken in the country outside the Foyle area.

Ulcerative Dermal Necrosis (UDN) continued to affect salmon and to a very much lesser extent brown trout and sea trout during the year. The incidence of disease in 1970 was at about the same level as in 1969, which in turn was at a much lower level than in the preceding three years. Outbreaks of disease were still somewhat serious in the Blackwater, Lee and Bandon and in two rivers flowing into Kenmare Bay. Considerably more than half the total number of affected fish were recorded from these rivers. The effect of the disease on spawning brown trout was considerably less than in 1969.

Investigations into the disease were continued as detailed in the section headed Scientific Investigations.

Reports from Boards of Conservators and other sources indicated that the runs of salmon smolts to the sea in 1970 were satisfactory and, once more, in rivers affected by UDN in preceding years, the smolt runs appeared to be as satisfactory as those in unaffected rivers.

In the 1969/70 season, 585,000 salmon ova were imported from Iceland for restocking rivers to offset UDN disease. A further 60,000 were imported from Sweden for the same purpose.

INLAND FISHERIES COMMISSION

In June, 1970, the Minister for Agriculture and Fisheries appointed a Commission to examine all aspects of inland fisheries (i.e. those for

salmon, trout, eels and coarse fish) including their tenure, development, management, administration, optimum utilisation and anti-pollution measures, and to make recommendations.

The Commission held its first meeting on 22nd June, 1970, and its work was still in progress at the close of 1970.

BOARDS OF CONSERVATORS.—Details of receipts and expenditure of Boards of Conservators in the fishery year ended 30th September, 1970, are given in Appendix No. 18

EMPLOYMENT IN THE INDUSTRY.—Exclusive of persons employed on the marketing and transport of fish a total of some 6,434 persons found either whole-time or part-time employment in inland fisheries during the year. The figure includes 4,144 persons estimated as engaged in netting for salmon under common law right, 536 employed by Boards of Conservators on protection of fisheries over the open and close seasons, 800 engaged in netting in the Foyle area or employed in that area as ghillies or on protection work, 148 engaged in development work on behalf of the Inland Fisheries Trust Inc. and the remainder employed by proprietors of commercial salmon fisheries, by fishery owners or by angling associations.

INSTRUMENTS OF CAPTURE.—The total number of fishing licences of all kinds issued during the year was 13,666 representing a total increase of 858 (divided as to 700 for rods and 158 for other engines) on the figure for 1969. The totals in recent years were:—

1970	...	13,666
1969	...	12,808
1968	...	11,796
1967	...	12,626
1966	...	13,809
1965	...	14,647
1964	...	13,598
1963	...	11,343
1962	...	10,479
1961	...	9,980

The number of the various classes of licences issued in each fishery district during the year and the rates of licence duty are given in Appendices Nos. 19 and 20 respectively.

EXPORTS OF FRESHWATER FISH.—Salmon:—The total quantity of salmon exported in fresh, chilled, frozen and smoked forms was 23,170 cwt. compared with 20,101 cwt. in 1969. Total value of these exports rose from £1,172,694 in 1969 to a new record figure of £1,217,079. Details for the two years are as follows:—

	1970		1969	
	cwt.	£	cwt.	£
Fresh, chilled and frozen salmon ...	22,287	1,099,835	19,351	1,087,650
Smoked salmon ...	883	117,244	750	85,044

Of the total quantity of fresh, chilled and frozen salmon exported in 1970, 15,646 cwt. went to Great Britain, 3,059 cwt. to France, 2,329 cwt. to the Six Counties, 432 cwt. to Spain and 365 cwt. to the Netherlands; smaller quantities went to Switzerland, Belgium, Sweden, Federal Republic of Germany, Lebanon, Republic of South Africa, Denmark, U.S.A., the Bahamas and Barbados. The smoked salmon was exported mainly to Great Britain (226 cwt.), Switzerland (154 cwt.), U.S.A. (141 cwt.), Republic of South Africa (116 cwt.), Six Counties (97 cwt.) and Federal Republic of Germany (66 cwt.). The average export price of fresh, chilled or frozen salmon was £49.35 as compared with £56.20 in 1969. The foregoing figures include landings of salmon in County Donegal from waters in the area administered by the Foyle Fisheries Commission.

Licences to export salmon under the Agriculture and Fishery Products (Regulation of Export) Act, 1947 (Export of Salmon) Order, 1954 (S.I. No. 275 of 1954) were issued to 98 persons or firms during the year.

Rainbow Trout.—Exports of rainbow trout in 1970 amounted to 900 cwt. valued at £25,270 as compared with 1,222 cwt. valued at £28,444 in 1969.

Eels.—Exports of eels in 1970 amounted to 4,325 cwt. valued at £120,772 as compared with 2,368 cwt. valued at £56,752 in 1969.

DEVELOPMENT OF EEL FISHING.—As in previous years every endeavour was made to encourage and develop eel fishing. Twenty-one eel fishing authorisations were issued to persons for the operation of eel fishing engines either on new sites or on sites where eel fishing had been formerly carried out but subsequently abandoned.

ARTIFICIAL PROPAGATION.—Details of salmon, sea trout and brown trout ova produced at the various hatcheries are given at Appendix No. 23.

The output of salmon ova in the 1969/70 spawning season amounted to 3,972,000. 360,000 salmon ova/fry were distributed from the Department's hatchery at Glenties, Co. Donegal.

Imports of ova by the Department from suitable disease-free sources abroad were as follows:—

<i>Salmon Ova</i>		<i>Sea Trout Ova</i>	
Iceland	... 585,000	Iceland	... 165,000
Sweden	... 60,000	Poland	... 80,000

The produce of this ova was in the main used to supplement home supplies for the re-stocking of rivers which had been affected by UDN disease,

The produce of Cong Hatchery was reared to the underyearling stage and was distributed as follows :

60,000	underyearlings to River Moy and tributaries
20,000	„ „ River Deel and tributaries
Balance	„ „ the Corrib System.

Over 3,000,000 brown trout ova, fry, summerlings, fingerlings, yearlings and adult fish were reared by Inland Fisheries Trust in their fish farms and rearing stations in 1970. More than half this output was released in waters under development and 1,277,000 were sold to angling interests and clubs.

50,000 rainbow trout fingerlings were reared for stocking Trust waters and in addition 267,000 ova, summerlings and yearlings were sold, chiefly to commercial fish farmers.

SCIENTIFIC INVESTIGATIONS.—Additional details of the work done in the freshwater field have been given in the *Inland Fisheries Bulletin* (No. 5) published earlier.

Investigations into the salmon stocks in a number of Irish rivers were made by members of the Department's staff during the year and analyses were also made of the catch returns from various river systems. In general these investigations have indicated that catches and runs of salmon (fish which have spent two or more years feeding in the sea) were still at a low level, whereas catches and runs of grilse were at a much higher level than had been the case for the decade up to 1961. The analyses of salmon stocks by scale reading undertaken by the Inspector of Fisheries on the inland fisheries side was extended in 1970 to include the North Mayo and Donegal open sea drift net fisheries and fisheries in Waterford Harbour and the River Blackwater. The results of the examination of fish taken in the open sea drift net fisheries indicate that few fish other than grilse were taken: the mesh size of the nets used would, in any case, not retain many of the larger fish. A high average weight of the grilse compared with those prior to 1961 was confirmed for at least the fourth year running.

One notable feature of the scale reading analysis was the dearth of previous spawners in the Rivers Blackwater, Erne, Moy and Shannon—due, it is thought, to the fact that kelts affected by UDN do not survive to any appreciable extent.

The Department's Inspector and Scientific Adviser, who acts as Scientific Adviser to the Foyle Fisheries Commission continued his work on the salmon and grilse of the River Foyle. He confirmed that for the third year running a high proportion of the fish taken in the River Foyle, weighing 8 lb. and upwards were grilse (less than two years feeding in the sea) and not salmon. Investigations of the life history of fish taken in the River Roe were also carried out and at the close of the period under review a report for publication in the Annual Report of the Commission was in an advanced state of preparation. The report on the 1969 investigations was published in the 18th Report of the Foyle Fisheries Commission.

During 1970 two members of the Department's staff undertook an appraisal of the long term statistics relating to Irish salmon and a report was prepared for inclusion in the *Irish Fisheries Investigations Series A* (Freshwater). Material was also collected for inclusion in the report of the Joint Working Party on North Atlantic Salmon of the International Council for the Exploration of the Sea (ICES) and the International Commission for the North-West Atlantic Fisheries. Ireland adheres to the former organisation but not the latter, being outside its functional area.

No clean salmon were tagged in the 1970 season and only small numbers of kelts were available for tagging, partly due to the adverse effects of UDN on the survival of kelts. Consequently only 299 kelts were tagged and five recaptures were made. Five recaptures, all in the Shannon, were made from the batch of smolts tagged in 1969 on the River Shannon. A total of 134 salmon smolts at the Cong rearing station and 905 wild smolts in the upper part of the Boyne system were tagged during the year.

During the year a number of recaptures were made of salmon tagged outside Ireland. The details were as follows:—

Place of tagging	Number of recaptures	Places of recapture
Disko Bay (West Greenland)	2	Waterville River and River Slaney
Off Faroes ...	3	Waterford Harbour, River Blackwater and south coast (details not available).
River Lagen (Sweden) ...	2	North Mayo coast, River Slaney.

The collection of biological data from tributaries of the Boyne up to then unaffected by drainage operations was continued in 1970. The object of these investigations is to build up a picture of the conditions in these tributaries prior to drainage. The age distribution of migrating smolts in the Blackwater tributary of the River Boyne was also investigated and comparisons made by scale reading with the smolt age distribution in the returning adults. Population estimates by electro-fishing methods were made for nine tributaries of the Boyne during the summer of 1970 to enable later comparisons to be made.

Investigations into the biology of eels were continued throughout the year. Samples of eels caught for restocking were examined. In June during the course of a two-week cruise on the River Shannon and a tributary, the Boyle River, samples of eels were taken by means of a train of eight summer fyke nets. Although the samples were small the stocks in the river system appear to be fairly uniform down to Clonmacnoise. At Portumna the proportion of small eels was substantially higher than in the upper waters. A more intensive study was made of Lough Key from July to September again using a train of eight fyke nets. In August a survey was made of the stocks

of eels in the channel in the South Sloblands in County Wexford. This revealed a much higher density of population than had been found elsewhere in the course of eel experiments. At the close of the year a detailed report on the series of fyke netting experiments was being prepared.

The work on the productivity of the River Owenea and its tributary, the Stracashel, in relation to salmon and trout was continued during the year. Samples were collected periodically to estimate seasonal growth rates of salmon parr and brown trout, and samples of smolts were collected in April and May from the smolt trap at Glenties to determine the age structure of the migrating smolts. Bottom fauna studies were continued. Investigations of a tributary of Lough Melvin, which had been selected for investigation in 1969, were continued. Electro-fishing operations were undertaken to ascertain the survival rate of the salmon fry planted out in the previous year.

During the year officers of the Department collaborated with a lecturer in the Zoology Department of University College, Dublin in collecting material for the study of parasites of salmon with a view to their possible use as "indicators" in studying the origin of salmon taken *inter-alia* off the West coast of Greenland. Officers of the Department also collaborated with an officer of the Fisheries Research Board of Canada who visited Ireland in April with a view to studying parasites of Irish salmon.

Regular visits were paid by a member of the Department's staff to all rainbow trout farms during the year and further data on production, survival and comparative growth rates of young fish were collected. A 20% increase in production was obtained at one of the smaller units resulting from more efficient feeding practices. Trials were carried out using certain home produced and imported pellets. It was shown that there had been a considerable improvement in the performance of the home produced pellet in its effect on growth rate and provided that the standard was maintained it was the best choice for rearing rainbow trout from fingerling to saleable size. The brood stocks of rainbow trout in the country were investigated. Great variations in fecundity of existing stocks were found as well as in the viability of the ova produced. The older brood fish (5 and 6 year olds) gave relatively poor results, compared with younger fish.

Char (*Salvelinus alpinus*) are relatively scarce fish in Irish waters and during the year fair numbers of specimens were identified from Lough Conn and Lough Corrib and single specimens from Lickeen Lake near Ennistymon, Co. Clare, Killarney Lakes and Lough Fee, Co. Galway. The latter specimen was the first to be recorded from that locality. A paper on the distribution of char was in an advanced stage of publication at the close of the year.

Investigations into Ulcerative Dermal Necrosis (UDN disease) were continued at the Department's Veterinary Research Laboratory at Abbotstown, Co. Dublin, in the Zoology Department of University College, Cork and the Botany Department of University College, Dublin. Brown trout with UDN were examined at Abbotstown for

certain biochemical characteristics and significant differences between affected fish and healthy fish were found in total serum protein, A₁ - albumin, a₁ - globulin and albumin/globulin (A/G) ratios. Comparison of similar characteristics in UDN affected and healthy salmon indicated significant differences in total serum protein. Investigations into the serum changes associated with UDN in brown trout were continued in the Zoology Department of University College, Cork. It was found that the protein level and the electrophoretic pattern changed, as in salmon with the disease. However the changes in trout were not as characteristic as those of salmon. Researches on the mycological aspects of the disease were continued in the Botany Department of University College, Dublin and in particular on the biology of a fungus of the genus *Saprolegnia* and its relationship to fish disease. In addition to the continuation of fundamental studies of the fungi themselves, studies on the use of antibiotics in the selective isolation of the fungus from water samples and studies aimed at controlling the growth of fungi were undertaken.

Considerable attention was given during the year to the rearing of salmon under artificial conditions. It was found that, because of their small size and early hatching, salmon ova imported from Iceland were unsuitable for artificial propagation under Irish conditions. The Department's Inspector of Fisheries on the inland fisheries side, who acts as technical adviser in the operation of the Cong salmon rearing station, was concerned in improving the early survival rate of salmon. This was achieved by feeding more frequently with a diet of liver rather than dry pellet feed. Treatment of parent fish affected by UDN at the Glenties hatchery with malachite green proved successful and none of the brood stock fish died.

The holder of one of the Department's studentships completed his study of pesticide residues in freshwater fish and their environments in September and a report on his findings was being prepared for publication at the close of the period under review. Another holder of a studentship was engaged on work on the eye-lens and other proteins and haemoglobins of different fish hybrids. Two other studentship projects—into the fauna and physics and chemistry of Loughs Sillan (Co. Cavan) and Dan (Co. Wicklow) and the bottom fauna of Lough Corrib—were initiated.

During the year a list of publications by the Department's staff on inland and marine fisheries and associated subjects published since 1950 was prepared for issue in the *Fishery Leaflet* series.

The scientific staff of the Department continued to advise the public on the management of fisheries and assistance was given to Boards of Conservators and others in investigating and controlling pollution and advising on protection problems generally. The staff also examined sets of scales and identified specimens of freshwater fishes for the general public and, in particular, for the Irish Specimen Fish Committee of which the Department's Inspector of Fisheries and Scientific Adviser is chairman. Specimens of the true roach (*Rutilus Vutilus*) were submitted for identification for the first time from the Erne system.

A considerable amount of time was given by one of the Assistant Inspectors of Fisheries to work connected with European Conservation year and he acted as the Fisheries Division's representative on the National Committee.

The Department's Inspector of Fisheries and Scientific Adviser continued to act as scientific adviser to the Foyle Fisheries Commission and as Director of Research to the Salmon Research Trust of Ireland, Inc.

ENGINEERING.—*Salmon Disease Investigations:*—The fish tanks installation needed by this Department's Veterinary Research officers for research into fish disease, especially UDN, were maintained in working order throughout the year. However, problems in maintaining a suitable uncontaminated water supply still remain.

As in previous years, liaison was maintained with other workers on the salmon disease at various University Faculties and where asked for, advice was supplied on the design and maintenance of research facilities.

The adult fish counting installation incorporated in a weir at Bandon, Co. Cork, to monitor the run of salmon in furtherance of the project to establish, if possible, the mortality in salmon due to UDN operated during the year, some alterations being made to prevent salmon from by-passing the counting installation.

Hydro-Electric Development.—The various hydro-electric installations continued to be kept under observation and the effects of their operation on fish life observed.

The five year programme of investigation of the effects of the hydro-electric scheme on the salmon stocks in the River Lee, which was completed in 1969, was reviewed. A programme of management for future years was drawn up after consultation with the various interested bodies and proposals were put forward to the E.S.B. which resulted in that Board undertaking to carry out further rehabilitation works including the building of a hatchery and rearing station with a capacity for 150,000 smolts.

Thermal Power Stations.—Attention continued to be paid to the possible effects on fishery interests of the operation of the thermal power stations at Great Island, Pigeon House and Tarbert. The evidence to hand to date would suggest that the danger of small fish being drawn into the intake screens at Great Island is not as serious as was feared. The clogging of the various screen installations at Tarbert by sea wrack and various marine algae is giving cause for concern and measures necessary to overcome this problem are being considered.

Arterial Drainage.—The concluding stages of drainage work have been reached on a number of major schemes such as the Moy and the Corrib/Headford and the main emphasis now is on the drainage

of the River Boyne catchment, in regard to which satisfactory liaison was maintained with the O.P.W. Engineers.

As part of an overall programme to conserve salmon stocks during the execution of the Boyne drainage scheme, an electric fish screen was erected on a trial basis at the mouth of the Trimbelstown River, a tributary scheduled for drainage in 1971. The purpose of the screen is to prevent salmon entering the tributary during dredging operations and divert them to other spawning areas where work is not in progress.

Plans were drawn up for the installation of an electronic salmon counter in the main river channel of the Boyne, below Navan, to monitor the runs of salmon in the Boyne system during and after the drainage scheme.

In the Corrib/Headford drainage scheme, particular attention was paid to the Owenriff, Cross and Ballynalty Rivers. A fish pass was designed for installation in a drop weir on the Ballynalty River but though it was not possible to have the work completed in time for the spawning season, it was sufficiently advanced to enable some fish to move across it and substantial spawning activity was observed upstream. A post-drainage survey of spawning conditions on the Owenriff and Cross rivers was carried out with encouraging results.

There were detailed discussions with the O.P.W. about the measures necessary to safeguard the fishery interest in the execution of the proposed Corrib/Mask Drainage Scheme. Likewise in the case of the River Bonet in Co. Sligo.

Post-drainage remedial works to meet the requirements of this Department were carried out by the O.P.W. in the River Deel catchment during the year.

Investigation of Fish Movements.—Counting of smolts on the River Corrib began on the 22nd March and continued to the 5th June when the main run ended. In all, 14,700 smolts were captured in 76 days of counting and released from the smolt trap at Galway Sluice Barrage. The maximum number of smolts taken from the trap in one day was 3,000 on the 10th May.

The total catch was much smaller than that of 1969 when 85,947 smolts were captured and released. Compared to 1969, the number of smolts captured in 1970 was down by 82%. While on the face of it, these figures appear alarming, it must be noted that during the smolt run, flow conditions in the River Corrib were such that the sluice gates had to be kept open to varying degrees to vent the flow and, under such conditions, it is probable that the main smolt run passed through the gates and by-passed the smolt counting installation.

A histogram of the run has been prepared and records have also been kept of the number of fish of other species counted and released from this smolt trap.

The alterations made to the trapping and counting installation at this trap to improve its efficiency and ease the problem of counting and releasing the smolts without injury operated very successfully. The adult salmon counting installations were maintained on the Corrib, Bunree, Liffey, Inagh, Blackwater and Bandon Rivers.

The runs recorded by these instruments are summarised as follows:—

TABLE

River	Location	Total Count	Daily Max.	Date
Corrib	Galway	12,718	766	8 June
Bunree	Downhill	140	17	22 January
Liffey	Islandbridge	261	12	24 April
Inagh	Ennistymon	466	56	6 August
Blackwater	Clondulane	3,196	211	29 October
Bandon	Bandon	958	6	20 December

A proposal by the Rosses Anglers' Association to install an electronic fish counter in the Dungloe River, Co. Donegal, with financial assistance provided by An Bord Fáilte was investigated and advised upon and the counter was brought into operation early in 1970. According to the information supplied by An Bord Fáilte, the number of sea trout counted going through this counter was as follows:—

May	...	18
June	...	196
July	...	404
August	...	1,118
September	...	4,150
October	...	24
Total :		5,910

Further information was collected on the relationship between fish movement and such factors as river flows, water temperatures and time of day, so that data can be acquired which will be of value in dealing with requests for the abstraction of water from rivers.

The major fish counting installation for both upstream and downstream migrating fish which was designed by the Inspector and Engineer for the Salmon Research Trust of Ireland Incorporated, was completed and came into operation in March. Since then,

according to the Salmon Research Trust of Ireland Incorporated the following is the number of fish recorded by this installation:—

Salmon	(Grilse)	...	663
Sea Trout		...	357
Smolts	(Salmon)	...	6,189
	(Sea Trout)	...	2,126
Kelts	(Salmon)	...	1,360

The experience of operation during the year indicated certain further improvements which could be carried out to increase the efficiency of the installation.

Fish Culture Installations.—Despite a decrease in the number of adult fish captured in the traps, the salmon hatchery and rearing station at Cong, Co. Mayo, operated by the Galway Board of Fishery Conservators, had a good year.

Underyearling salmon were reared and distributed as shown in the section headed Artificial Propagation.

In addition, about 25,000 brown trout were reared to the under-yearling stage for distribution in the Corrib System.

The capture of adult fish at the salmon traps in this hatchery up to the end of December, 1970, was most encouraging.

Plans for the proposed extension of the rearing facilities at this hatchery were prepared but further work on this project has been deferred for the present.

Glencullin Salmon Stripping Station.—Due to difficulties in acquiring the site, it was not possible to commence construction work on this installation at Glencullin Bridge near Carrowmore Lake, Co. Mayo. Alternative sites were investigated but were found to be unsuitable. It is expected that the difficulties about the chosen sites will be overcome and that work on this project will go ahead in 1971.

Provision of Adult Salmon for Brood Stock.—Work was started by the Office of Public Works on the conversion of one of the disused salmon cribs in the salmon weir owned by the Moy Fishery Company at Ballina, to convert this into an experimental holding pen for salmon to which salmon caught commercially can be transferred after purchase and retained for brood stock purposes. It is hoped in this way to obtain the necessary numbers of fish to meet the demands for salmon ova without any impairment of the run of fish upstream in this river system for angling and spawning needs.

Virginia Salmon Hatchery and Rearing Station.—Plans were prepared and arrangements initiated for the construction of a salmon hatchery and rearing station at Virginia, Co. Cavan. This installation will be financed by the O.P.W. as part of the post-drainage rehabilitation programme for the Boyne Catchment Area. On completion, the

installation will be operated by the Drogheda Board of Fishery Conservators and the produce employed to the extent necessary to restock the rivers in the Boyne catchment which have been affected by the drainage operations, any balance available being used to restock other river systems where necessary.

River Improvement Schemes.—A number of proposals for river improvement schemes were investigated during the year by this Department's Supervisors under the guidance of the Engineers. Improvement works were carried out principally in the Cork fishery district and the Letterkenny fishery district.

Improvement works carried out in previous years were kept under observation and in a number of cases, it was noted that some modifications of devices employed will have to be carried out to increase their efficiency and to reduce maintenance charges.

At the request of the Foyle Fisheries Commission, a detailed investigation was made of the need for additional facilities for the passage of salmon across Sion Mills Weir, Co. Tyrone and detailed proposals including the design of a fish pass and counting installation were prepared for the Commission by the Inspector and Engineer.

The problem of overcutting of spawning redds by late running salmon was investigated with the object of devising a method whereby this would be prevented. Acting on reports received of experiments carried out in Scotland, tests of a similar nature were carried out in Ireland using orange-coloured plastic streamers. The plastic used was 500 gauge from which streamers were manufactured each 6' 6" long \times 2" wide. These were anchored to small spikes driven into the river bed upstream of the redds. The streamers floated downstream over the completed redd and the velocity of the water flowing across the redd induced an undulating movement in the streamer over the redd area which was successful in deterring subsequent spawning fish from disturbing the redd. In the course of the experiment, the streamers were used in areas where the problem of overcutting was known to exist. 16 redds were protected in this way by streamers. There was no evidence of any overcutting of these redds. This experiment has been repeated in the 1970/71 spawning season.

Eel Fishery Development.—Various eel fishery installations in existence or projected were investigated and the owners advised on desirable improvements to increase their efficiency or otherwise to ensure that the structures complied with the fishery laws.

Experiments mounted at the research centre at Glenties Hatchery, Co. Donegal, to evaluate mechanical and electrified elver traps were inconclusive because the elver run was very small. Experiments on electrical devices for the trapping of eels is described under.

Application of Electricity to Inland Fisheries.—At the State salmon hatchery at Glenties, Co. Donegal, research and development work was continued by this Department's Consultant in association with the

Inspector and Engineer. There were many applications for Section 171 Licences to permit the discharge of effluent intrinsically deleterious but so controlled as to have effects within tolerable limits on the receiving water. Discussions were held with the promoters or their consultants to ensure that adequate treatment plants would be provided.

Electric Barriers.—The new electric barrier on the Stracashel Weir at Glenties was operated successfully as required for use in the capture of white trout for the hatchery operations.

A new and original approach to the problem of smolt guiding by electrified barriers was tried out. The polarity of the existing conventional electric screen was reversed and the suspended screen elements were energised sequentially as anodes. However, it was found that some smolts were being injured and the experiment was abandoned. The technique employed was subsequently used for a different purpose as described below.

Electric Fishing.—The principle of sequential anodic switching was employed with encouraging results in an electrified fish trap, code-named PET (Programmed Electronic Trap). This device consists of four 20 ft long 2" diameter tubes laid on the river bed and energised to direct fish to a holding trap. It has been used with some success in the capture both of eels and brown trout. This line of development is being pursued further.

Electronic Salmon Counters.—The evaluation and development of the wide gap bio-electric fish counter, code-named Delta V, described in last year's report, continued. River trials on a 60 ft. weir confirmed the result of tank tests. Problems arose from earth "loops" from the national electricity grid but these have been largely overcome. The results obtained by instrumental monitoring suggests that this is a successful device for the counting of trout and salmon but as yet, the results have not been confirmed by supplementary counting arrangements.

Rainbow Trout Fish Farming.—Proposals for the alteration of one existing fish farm unit were investigated and approved and plans for the construction of a new ancillary unit were authorised.

Water Abstraction.—An increasing number of proposals to abstract water from fishing rivers for domestic and other purposes are being submitted and these are being investigated in detail and steps taken to ensure that fishery interests would be safeguarded.

Polluting Effluents.—Problems of pollution arising from domestic, industrial and agricultural sources were dealt with. Proposals for new industrial projects were carefully studied to ensure that their functions would not be detrimental to the welfare of fish populations.

Miscellaneous.—The Inspector and Engineer continued to act as Fisheries Engineering Consultant to the Salmon Research Trust of

Ireland Incorporated, and to the Foyle Fisheries Commission. He also continued to act as Council Member of the Inland Fisheries Trust Incorporated.

The Inspector and Engineer attended a symposium on Food and the Law in Spring 1970 which was organised in Dublin by the Republic of Ireland Branch of the Institute of Food Science and Technology.

One of the Engineers attended the post-graduate's course on Water Quality Management, organised by the Engineering School of University College, Dublin, under the direction of Professor J. C. I. Dooge.

The Department's Fisheries Engineers participated in the series of symposia organised in Dublin and at suitable centres throughout the country as a contribution to the Conservation Year Programme at which they delivered illustrated lectures outlining the function of the Fisheries Engineer in conservation, particularly as regards fish and fish life.

Visitors.—Dr. J. Hellawell of the Freshwater Biological Association of Britain who is carrying out a study of the state of development of automatic fish counters for the Natural Environment Research Council of Britain, visited the Division's Research Centre at Glenties to study the work being done in the development of the Delta V wide-gap bio-electric salmon counter by the Department's consultant.

FOYLE FISHERIES COMMISSION.—The Annual Report of the Foyle Fisheries Commission for the year ended 30th September, 1970 gives detailed information on the Commission's activities during the year covering mainly

1. Conservancy—including protection, control of pollution, hatchery work and research and experimental work;
2. Management of the commercial fishery operated by the Commission.

The following are the salient points of the Report:—

(a) Runs of fish in the Foyle River System were better than in 1969 and the catch of salmon and grilse by commercial engines (113,649) was up on the 1969 figure (106,901). So also was the rod catch of both salmon and sea trout which was 3,057 compared with 1,977.

(b) The 1970 season was an above average wet one for the Foyle Area which helped the escapement of fish into freshwater. While there was an improvement in the spawning position over the previous season when drought conditions prevailed, spawning was still not up to the level of some years ago.

(c) The total catch of 11,009 salmon and grilse in the Londonderry Fishery was down on the 1969 figure of 12,089. The Fishery still

made a profit of £15,567 (compared with £21,748 in 1969) which helped the Commission to carry forward a reduced surplus of £4,093. The Commission was not able to make any surrender to the two Exchequers on the basis of its financial returns this year but it has over the years surrendered a total of £46,200, this amount being divided in equal shares between the two Exchequers.

The Accounts for the year are given in Appendix I and particulars of the Regulations made by the Commission in the year are included in Appendix VI of their Report.

INLAND FISHERIES TRUST INCORPORATED.—The Annual Report of the Inland Fisheries Trust for 1970 outlines the progress made by the Trust during the year. The Grant-in-Aid was increased to £220,000 compared with £200,000 in 1969 and £180,000 in 1968.

Work was continued during 1970 on the development, improvement and maintenance of trout fisheries on lakes and rivers. Approximately 2,000,000 trout fry, summerlings, fingerlings and yearlings were released in waters where natural production was inadequate; and to control predators 24.2 tons of pike and 46.8 tons of perch were removed from trout lakes.

Work on the survey and follow-up development of coarse fishing waters was further extended in 1970. Surveys were carried out on 91 waters at 33 different centres and development work undertaken on 40 waters at 23 centres as well as maintenance of earlier improvement works. It is estimated that the waters developed provide angling space for some 5,000 anglers at any one time.

The programme of surveying and charting of sea angling fishing grounds was continued off the west coast. The Trust acquired its own deep sea angling survey boat during the year.

SALMON RESEARCH TRUST OF IRELAND INCORPORATED.

The Salmon Research Trust's Annual Report gives a detailed account of the work carried out by the Trust during 1970.

Investigations into the breeding and rearing of fish of known parentage continued during the year.

A summary of experimental work carried out on salmon and sea trout hybrids during the years 1960/70 is published as an appendix to the Report. The report of the Peat Silt Research Group was presented to the Trust during the year and this is also presented as an appendix to the Report.

Some ancillary works were carried out at the fish trapping installation at the Salmon Leap, Furnace, Co. Mayo.

MANAGEMENT OF STATE FISHERIES.—128 State owned fisheries were managed by Fisheries Division in 1970 and the amount received in rents during the year was £3,806 compared with £3,954 in 1969.

Nine of these fisheries were advertised for letting during the year.

ECONOMIC EVALUATION OF FISHING.—Evaluation studies of salmon fishing, being undertaken by the Economic and Social Research Institute on behalf of Fisheries Division, continued during 1970. The Institute completed the Pilot Study on which the major evaluation survey is being based and work on the main survey has commenced. This survey will continue in 1971.

Evaluation studies of brown trout, coarse fishing and sea angling for which Bord Failte Eireann are responsible, continued in 1970.

INTERNATIONAL AND OTHER CONFERENCES.

1. INTERNATIONAL COUNCIL FOR THE EXPLORATION OF THE SEA

As mentioned earlier this Council held its annual conference in Copenhagen from 28th September to 7th October. The Department's Inspector and Scientific Adviser read a paper to the Anadromous and Catadromous Fish Committee dealing with his work on the salmon of the River Foyle and attended a meeting of the ICES/ICNAF Working Party on North Atlantic Salmon held in conjunction with the Council's annual conference. The Inspector of Fisheries on the inland fisheries side also took part in the main meeting of the ICES/ICNAF Working Party on North Atlantic Salmon held in London in February, 1970, and contributed a paper on "Irish salmon, homewater stocks and exploitation."

2. EUROPEAN INLAND FISHERIES ADVISORY COMMISSION

The Commission held its Sixth Session at Krakow, Poland from 18th to 22nd May, 1970. It was preceded on 15th and 16th May by an FAO/EIFAC Symposium on the Nature and Extent of Water Pollution Problems Affecting Inland Fisheries in Europe. Delegates from eighteen member countries, together with observers from one country and from eight International Organisations attended the meeting. The Irish delegation consisted of three officers of the Department, one representative of An Foras Taluntais and one of the Electricity Supply Board. Matters of particular interest dealt with were

1. Economic Aspects of Inland Fisheries and
2. Water Pollution Problems.

Research and field work on the economic aspects of inland fisheries which had been encouraged by the fifth session took place in many European countries during the inter-sessional period. At the request of the EIFAC Secretariat, Mr. A. L. W. Tuomi, Economist of the Department of Fisheries and Forestry of Canada, visited Ireland in September, 1969, for discussions with interested bodies on the economic evaluation of commercial and sport fisheries. As indicated at Page 34 evaluation of certain types of fishing in Ireland continued during 1970 and, during the Session, the Irish delegation reviewed the progress accomplished.

A number of recommendations were made at the pollution symposium. These included the reviewing by Member Countries of EIFAC of their existing legislation on water quality and quantity from a fisheries viewpoint, and that FAO should be requested to undertake research relating to organic wastes from agriculture and food production industries and the use of chemical fertilizers.

A Consultation on eel fishing gear and techniques was held in Bundesforschungsanstalt für Fischerei, Hamburg, in October, 1970 by permission of the Government of the Federal Republic of Germany, in accordance with a recommendation of the Sixth Session. The Department's Inspector and Engineer acted as Convenor at this Consultation which was attended by experts from 8 countries. Some 25 papers, including one on the Biology of Irish eels, were presented and discussed. A report of the proceedings, including the papers presented, has been prepared and edited by the Inspector and Engineer for printing and distribution internationally by EIFAC.

3. SALMON RESEARCH GROUP

This body which is sponsored by the British Natural Environmental Research Council had two meetings during the year. The Department's Inspector of Fisheries and Scientific Adviser and an Assistant Inspector of Fisheries attended. The spring meeting, held in Braemar, Aberdeenshire in April, 1970 was devoted to a study of the work being done on ascending and descending migratory fish in a small river in the neighbourhood as well as to productivity of rivers generally. The second meeting of the Group held in London in November, 1970 was attended by the Department's Inspector of Fisheries and Scientific Adviser, and the Inspector of Fisheries on the inland fisheries side. A joint paper on the fluctuations in the characters of salmon was contributed by them based on information contained in a paper which was subsequently published in *Irish Fisheries Investigations, Series A, (Freshwater)*.

4. EUROPEAN CONSERVATION YEAR

An Assistant Inspector of Fisheries on the inland fisheries side who acted as this Department's representative on the National Committee for European Conservation Year was a member of the Irish delegation to the European Conservation Conference in Strasbourg in February, 1970.

5. ATLANTIC SALMON ASSOCIATION

This North American body invited the Department's Inspector and Scientific Adviser to give the Centennial Lecture on Irish salmon and salmon fisheries in Montreal, Canada in February, 1970. He also gave lectures to audiences in the University of Guelph at Guelph, Ontario, the University of New Brunswick in Fredericton, New Brunswick, Memorial University, St. John's, Newfoundland, all in Canada and at the University of Maine, Bangor Maine in the United States. He also gave informal lectures at St. Andrews, Canada and the Boothbay Harbour and Woods Hole Laboratories of the Bureau of Commercial Fisheries of the United States. The lectures will be published under the Centennial scheme.

6. INFORMAL FRESHWATER RESEARCH GROUP

Representatives of the scientific and engineering staffs of the Department took part in the meeting of the above informal group, held under the joint chairmanship of Professor C. F. Humphries and the Department's Inspector of Fisheries and Scientific Adviser in the Zoology Department of University College, Dublin. Staff members described the research work which they were undertaking.

LEGISLATION.—Particulars of Statutory Instruments relating to Inland Fisheries made during the year are included in Appendix No. 22.

JOHN FAHEY,

Parliamentary Secretary to the
Minister for Agriculture and Fisheries.

12th April, 1972.

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APPENDIX No. 1

Quantity and Value of Sea Fish (excluding Salmon) returned as landed in 1969 and 1970

Kinds of Fish	QUANTITY		VALUE	
	1970	1969	1970	1969
	cwt.	cwt.	£	£
Soles	3,483	3,474	90,084	79,527
Brill	2,543	2,290	28,537	22,298
Turbot	2,220	1,647	23,814	16,445
Plaice	32,580	38,286	304,554	304,084
Dabs	3,947	3,364	13,740	9,768
Megrimms	2,787	2,768	10,927	8,766
Other Flat Fish	4,457	4,831	18,008	16,449
Ray/Skate	29,233	28,740	165,221	130,813
Cod	54,161	52,696	267,970	229,977
Haddock	61,375	41,134	230,934	145,790
Hake	951	1,459	6,095	10,169
Whiting	77,568	97,256	198,120	211,965
Pollack	18,703	17,947	50,615	42,060
Other Round Fish	7,966	18,578	19,744	25,774
Total Demersal ...	301,974	314,470	1,428,363	1,253,885
Herrings	894,677	682,238	1,275,442	783,973
Mackerel	20,683	31,801	39,641	45,352
Sprats	107,795	46,413	65,947	21,792
Total Pelagic ...	1,023,155	760,452	1,381,030	851,117
TOTAL WET FISH ...	1,325,129	1,074,922	2,809,393	2,105,002
	Nos.	Nos.		
Lobsters	494,957	527,340	329,030	336,978
Crawfish	155,344	113,747	191,018	133,429
Crabs	1,264,821	1,191,571	48,069	38,531
Escallops	322,719	294,905	14,620	10,951
Oysters	1,619,381	2,650,754	51,205	75,802
	cwt.	cwt.		
Dublin Bay Prawns	39,839	27,014	251,976	145,885
Mussels	66,383	52,684	42,460	31,879
Periwinkles	35,279	40,786	93,977	101,170
Other Shellfish	* 31,342	4,570	79,716	15,923
Total Value Shellfish ...	—	—	1,102,071	890,548
TOTAL VALUE ALL FISH ...	—	—	3,911,464	2,995,550

* This figure includes landings of 26,915 cwt. of queen scallops valued at £69,987.

APPENDIX No. 2

Comparison of the Average Price per cwt. of various kinds of Sea Fish for the years 1963—1970

	1963	1964	1965	1966	1967	1968	1969	1970
	£	£	£	£	£	£	£	£
Soles ..	17.77	18.73	22.55	23.25	21.51	21.88	22.89	25.86
Brill ..	11.05	10.79	10.69	10.87	10.08	9.73	9.74	11.22
Turbot ..	10.70	10.05	10.36	10.69	9.80	10.00	9.98	10.73
Plaice ..	7.74	7.36	7.62	7.92	7.75	7.22	7.94	9.35
Dabs ..	2.70	2.52	2.71	2.63	2.61	2.50	2.90	3.48
Megrims ..	2.87	2.55	3.40	3.80	3.14	2.83	3.17	3.93
Ray/Skate ..	3.68	3.66	4.08	4.02	4.16	4.36	4.55	5.65
Cod ..	5.66	3.87	4.08	3.95	3.62	3.36	4.36	4.95
Haddock ..	3.67	2.46	3.10	3.65	3.74	3.63	3.55	3.76
Hake ..	7.41	5.97	6.60	10.20	9.12	6.94	6.97	6.41
Whiting ..	2.05	1.85	1.95	2.17	1.95	1.86	2.18	2.55
Pollack ..	3.52	3.22	2.59	2.67	2.36	2.38	2.34	2.71
Herrings ..	1.17	0.97	1.20	1.36	1.07	1.10	1.15	1.43
Pilchards ..	3.64	2.71	4.03	0.55	0.43	0.65	—	—
Mackerel ..	2.25	1.48	1.14	1.57	1.16	1.14	1.43	1.92
Sprats ..	0.43	0.41	0.41	0.41	0.58	0.42	0.47	0.61

N.B.—“Average price” as shown in this table represents total value divided by total weight for each kind of fish, year by year. It does not purport to take direct cognizance of any abnormal rise or fall in price attributable to a seasonal glut or shortage of a particular kind of fish.

APPENDIX No. 3

Value of Landings of Sea Fish (excluding Salmon) at ports at which the value of such landings exceeded £25,000 in 1970.

Port	Total Value 1970 £	Demersal £	Pelagic £	Shellfish £
1. Killybegs ..	609,124	346,017	262,922	185
2. Dunmore East ..	557,777	10,655	534,857	12,265
3. Howth ..	303,953	187,993	7,396	108,564
4. Cobh ..	279,897	3,931	274,508	1,458
5. Castletownbere ..	225,946	92,871	59,631	73,444
6. Kilmore Quay ..	166,373	123,712	7,298	35,363
7. Galway/ Aran Islands ..	137,969	72,688	38,210	27,071
8. Dun Laoghaire ..	120,987	90,759	1,025	29,203
9. Mornington ..	115,894	647	114,332	915
10. Dingle ..	111,760	56,623	5,608	49,529
11. Skerries ..	104,394	41,854	960	61,580
12. Burtonport ..	91,661	61,566	18,045	12,050
13. Greencastle ..	82,894	80,852	—	2,042
14. Carna ..	61,279	1,200	180	59,899
15. Fenit ..	46,315	—	—	46,315
16. Arklow ..	41,284	40,534	750	—
17. Achill ..	41,133	21,393	—	19,740
18. Clogherhead ..	38,336	24,001	1,719	12,616
19. Clifden/Cleggan ..	37,800	1,604	300	35,896
20. Schull ..	34,492	15,506	1,441	17,545
21. Wexford ..	34,243	13,667	100	20,476
22. Valentia Harbour ..	32,903	14,090	2,102	16,711
23. Goleen/ Crookhaven ..	31,806	—	—	31,806
24. Union Hall ..	28,879	19,651	1,112	8,116
25. Blacksod ..	25,053	—	—	25,053

APPENDIX No. 4

Imports and Exports of Fish and Fishery Products in 1970 (as compared with 1969)

	Quantity		Value	
	1970	1969	1970	1969
	cwt.	cwt.	£	£
I.—IMPORTS :				
Fish, fresh, chilled or frozen	28,545	17,444	105,582	118,674
Fish, cured, not in airtight containers	32,480	34,990	308,811	277,743
Fish and fish preparations in airtight containers	23,378	29,579	704,202	873,800
Other fish and fish preparations	27,131	28,701	665,717	593,046
TOTALS	111,534	110,714	1,784,312	1,863,263
II.—EXPORTS :				
Fish, fresh, chilled or frozen:				
Salmon	22,287	19,351	1,099,835	1,087,650
Herrings	258,404	181,636	618,031	292,822
Freshwater Eels	4,325	2,368	120,772	56,752
Other Fish	24,733	14,884	223,708	155,506
Fish, dried, salted or smoked not in airtight containers	295,351	306,317	839,291	637,567
Shellfish, fresh, chilled, frozen, salted or dried	97,545	89,637	1,290,601	1,089,971
Other fish and fish preparations	25,729	16,079	408,431	237,259
TOTALS	728,374	630,272	4,600,669	3,557,527

APPENDIX No. 5

HERRING FISHING, 1970

County	Ports at which more than 500 cwt. were landed	Total Quantity cwt.	Value £
Louth	Clogherhead	734	1,315
Meath	Mornington	77,314	46,392
Dublin	Howth	2,372	4,448
Wicklow	—	550	1,200
Wexford	Kilmore Quay	4,577	8,530
Waterford	Dunmore East	317,566	533,912
Cork	Cobh, Baltimore, Castletownbere	177,600	345,073
Kerry	Caherdaniel, Dingle	2,980	4,700
Clare	—	—	—
Galway	Galway	29,210	36,330
Mayo	—	—	—
Sligo	Sligo	15,150	18,125
Donegal	Killybegs, Burtonport	266,624	275,417
	TOTALS	894,677	1,275,442

APPENDIX No. 6
MACKEREL FISHING, 1970

County	Ports at which more than 250 cwt. were landed	Total Quantity cwt.	Value £
Louth	—	153	464
Meath	Mornington	1,042	580
Dublin	Skerries, Howth, Dun Laoghaire	2,025	4,961
Wicklow	—	180	543
Wexford	Kilmore Quay	615	1,626
Waterford	Dunmore East	574	1,806
Cork	Union Hall, Schull, Castle-townbere	3,716	9,673
Kerry	Valentia Harbour, Dingle, Ballinskelligs	3,538	5,493
Clare	—	900	2,395
Galway	Galway	1,380	3,185
Mayo	—	750	1,625
Sligo	—	150	415
Donegal	Killybegs	5,660	6,875
TOTALS	...	20,683	39,641

APPENDIX No. 7

REGIONAL DISTRIBUTION AND CLASSIFICATION OF FISHING CRAFT AND OF PERSONNEL ENGAGED IN FISHING IN 1970

Coast	How Engaged	Men	Total Vessels	MOTOR VESSELS						Boats propelled by outboard engines, sails or oars	
				Gross Tons						18' Keel and upwards	Less than 18' Keel
				Over 75	51—75	26—50	16—25	11—15	10 and under		
EAST (Omeath to Carnsore Point)	Solely Partially Laid-up	533 217	146 64	9 —	23 —	54 —	5 —	— —	24 6	30 41	1 17
	TOTALS	750	210	9	23	54	5	—	30	71	18
SOUTH (Carnsore Point to Loop Head)	Solely Partially Laid-up	526 778	173 338	5 —	25 —	38 —	14 —	5 1	60 96	26 162	— 79
	TOTALS	1,304	511	5	25	38	14	6	156	188	79
WEST (Loop Head to Erris Head)	Solely Partially Laid-up	276 1,453	379 258	— —	2 —	20 —	2 —	6 —	165 39	153 89	31 130
	TOTALS	1,729	637	—	2	20	2	6	204	242	161
NORTH (Erris Head to Moville)	Solely Partially Laid-up	629 1,449	377 272 3	12 1	7 2	48 —	9 —	11 —	169 77	113 117	8 78
	TOTALS	2,078	652	13	9	48	9	11	246	230	86
TOTALS (All Coasts)	Solely Partially Laid-up	1,964 3,897	1,075 932 3	26 1	57 2	160 —	30 —	22 1	418 218	322 409	40 304
	TOTALS	5,861	2,010	27	59	160	30	23	636	731	344

APPENDIX No. 8

TRAWLING AND SEINING, 1970

Port or Locality	Number of men engaged	Number of boats engaged	Tonnage of Motor Boats			Fishing Period
			Not exceeding 10 tons	Over 10 tons	Over 15 tons	
Clogherhead ...	30	7	—	—	7	All year.
Balbriggan ...	32	7	—	—	7	All year.
Skerries ...	50	10	—	—	10	All year.
Howth ...	200	37	—	—	37	All year.
Dun Laoghaire ...	75	15	—	—	15	All year.
Arklow ...	49	11	—	—	11	All year.
Wexford ...	10	2	—	—	2	All year.
Rosslare ...	3	1	1	—	—	All year.
Kilmore Quay ...	60	12	2	—	10	All year.
Duncannon ...	20	5	3	—	2	All year.
Passage East ...	6	2	2	—	—	Autumn and Winter
Dunmore East ...	30	6	—	—	6	All year.
Helvick ...	10	2	—	—	2	All year.
Youghal ...	6	2	2	—	—	Winter.
Ballycotton ...	9	3	2	—	1	All year.
Cobh ...	14	4	3	—	1	All year.
Kinsale ...	12	3	—	2	1	All year.
Union Hall and Raheen ...	22	5	—	2	3	All year.
Schull ...	23	5	—	1	4	All year.
Castletownbere ...	63	12	—	1	11	All year.
Ballinskelligs ...	6	1	—	—	1	All year.
Valentia ...	20	4	—	—	4	All year.
Cahiriveen and Portmagee ...	60	12	—	—	12	All year.
Dingle ...	75	15	—	1	14	All year.
Galway and Aran Islands ...	7	2	—	1	1	All year.
Cleggan and Inisboffin ...	24	6	—	—	6	All year.
Achill ...	8	2	—	1	1	Spring, Summer and Autumn
Killala ...	6	2	2	—	—	Spring, Summer and Autumn
Enniscrone ...	20	4	—	—	4	All year.
Sligo ...	215	34	—	—	34	All year.
Killybegs ...	80	13	—	—	13	All year.
Burtonport ...	4	1	—	—	1	All year.
Dunfanaghy ...	8	2	—	—	2	All year.
Buncrana ...	87	19	—	—	19	All year.
Greencastle ...						
TOTALS ...	1,344	268	17	9	242	

APPENDIX No. 9

STATEMENT OF ACCOUNT IN RESPECT OF REPAYABLE ADVANCES

I. Advances of £408,500 made to the Irish Sea Fisheries Association Ltd. during the period of twenty-one years to 23 April, 1952, for the provision of boats and gear:—

	£
Advances and interest thereon up to 31 March, 1960	566,255
Repayments made to 31 March, 1960 ...	248,281
Amount written off in 1961-62 ...	186,000
Balance of advances to be repaid by a new annuity	131,974

566,255

Instalments of new annuity to accrue up to 1972 ... 160,433

Repayments of new annuity :	
made to 31 March, 1969 ...	113,637
made during year ended 31 March, 1970 ...	13,369
not accrued at 31 March, 1970 ...	33,427

160,433

II. Advances of £63,215 made to Irish Sea Fisheries Association Ltd. during the period of five years to 23 April, 1952 for purposes other than boats and gear:—

	£
Total repayments to be made including interest ...	85,973

Repayments:	
made to 31 March, 1969 ...	75,316
made during year ended 31 March, 1970 ...	3,571
not accrued at 31 March, 1970 ...	7,086

85,973

III. Advances of £2,999,563 made to An Bord Iascaigh Mhara during the period of eighteen years to 31 March, 1970 for the provision of boats and gear and other purposes:—

Repayments of principal :	£
made to 31st March, 1969 ...	578,858
made during year ended 31 March, 1970 ...	89,567
Principal written off to 31 March, 1970 ...	217,584

Total repaid or written off at 31 March, 1970 ... 886,009

Balance of principal outstanding at 31 March, 1970 2,113,554

APPENDIX No. 10

COASTAL EXTENT OF FISHERY DISTRICTS AND NAMES OF THE PRINCIPAL RIVERS IN EACH DISTRICT

District	Coastal Extent of District	Principal Rivers
No. 1 Dublin	Most easterly point on Red Island, Skerries, to Wicklow Head.	Liffey Vartry.
No. 2 Wexford	Wicklow Head to Kiln Bay, east of Bannow Bay, Co. Wexford.	Slaney Avoca.
No. 3 Waterford	Kiln Bay, east of Bannow Bay, to Helvick Head, Co. Waterford.	Suir Barrow Nore.
No. 4 Lismore	Helvick Head to Ballycotton Pier, Co. Cork.	Blackwater, Funcheon, Bride, Awbeg.
No. 5 Cork	Ballycotton Pier to Crow Head, Co. Cork.	Lee, Owenboy, Bandon, Argideen, Ilen, Mealagh, Owvane, Coomhola, Glengarrif, Adrigole.
No. 7 Kerry	Crow Head, Co. Cork, to Kerry Head, Co. Kerry.	Roughty, Sheen, Finnihey, Blackwater, Sneem, Laune, Flesk, Maine, Caragh, Currane, Cummeragh, Inny.
No. 8 Limerick	Kerry Head, Co. Kerry, to Hag's Head, Co. Clare.	Shannon, Deel, Fergus, Mulcair, Little and Upper Brosna, Inny, Maugue, Feale.
No. 91 Galway	Hag's Head to the sea point of the boundary between the townlands of Keeraunagark South and Banraghbaun South, Co. Galway.	Corrib, Claregalway.
No. 92 Connemara	The sea point of the boundary between the townlands of Keeraunagark South and Banraghbaun South, Co. Galway, to Slyne Head, Co. Galway.	Ballinahinch, Recess, Cashla, Owengowla, Invermore, Inverbeg, Screebe, Furnace.
No. 101 Ballinakill	Slyne Head to Pigeon Point, Westport Bay, Co. Mayo.	Culfin, Errif, Bundo- dorragea, Dawros, Carrowniskey, Bun- owen (Louisburgh).
No. 102 Bangor	Pigeon Point to Benwee Head, Co. Mayo.	Newport, Burrishoole, Owenduff, Owengarve, Owenmore, Glenamoy.
No. 11 Ballina	Benwee Head to Coonamore Point, Co. Sligo.	Moy, Cloonaghmore (Palmerston), Easkey,

District	Coastal Extent of District	Principal Rivers
No. 12 Sligo	Coonamore Point to Carrickgarve, Co. Sligo.	Ballisodare, Garavogue (Sligo), Bonet, Drum- cliff.
No. 13 Ballyshannon	Carrickgarve to Rossan Point, Co. Donegal.	Erne, Bundrowes, Bundo- duff, Eske, Eaney Water, Oily, Glen.
No. 141 Letterkenny	Rossan Point to Malin Head, Co. Donegal.	Owenea, Gweebarra, Gweedore (Crilly), Clady, Lackagh, Len- non, Crana.
No. 172 Dundalk	Carlingford Lough to Clogherhead, Co. Louth.	Fane, Dee, Glyde.
No. 171 Drogheda	Clogherhead to the most easterly point on Red Island, Skerries, Co. Dublin.	Boyne, Blackwater, Deel.

Note—The area comprised in the former No. 142 or Merville District was, by the Foyle Fisheries Act, 1952, incorporated in the Foyle Area which is administered by the Foyle Fisheries Commission.

APPENDIX No. 11

Quantity and Value of all Salmon and Sea Trout taken in 1968, 1969 and 1970 by Instruments of Capture.

SALMON						
	1970	1969	1968	1970	1969	1968
Instruments	lb.	lb.	lb.	£	£	£
Total for all engines	3,510,748	3,403,849	2,702,248	1,228,762	1,107,788	699,428
Total for rod and line	136,849	182,248	251,432	47,895	60,786	81,645
Total for drift nets	1,730,918	1,678,482	1,040,356	605,821	545,507	259,302
Total for draft nets	1,260,986	1,206,779	1,059,227	441,345	392,203	260,257
Total for stake nets, weirs, etc.	381,748	336,340	351,233	133,701	109,292	98,224

SEA TROUT						
	1970	1969	1968	1970	1969	1968
Instruments	lb.	lb.	lb.	£	£	£
Total for all engines	106,951	127,272	124,679	26,738	23,864	22,982
Total for rod and line	60,650	71,555	69,584	15,164	13,417	12,541
Total for drift nets	5,119	7,929	8,147	1,279	1,487	1,639
Total for draft nets	40,308	46,790	45,898	10,077	8,773	8,598
Total for stake nets, weirs, etc.	874	998	1,050	218	187	204

This Appendix does not include returns from the former Moville District.

APPENDIX No. 12

Quantity and Value of Salmon taken in 1968, 1969 and 1970 by Fishery Districts.

Fishery District	*	Quantity			Value		
		1970 lb.	1969 lb.	1968 lb.	1970 £	1969 £	1968 £
Dublin	R N	1,957 5,637	982 10,163	3,437 19,979	685 1,973	348 3,422	1,356 4,697
Wexford	R N	3,880 26,158	1,782 20,802	4,686 25,297	1,358 9,155	617 6,758	2,037 6,393
Waterford	R N	12,243 593,294	30,078 658,087	40,609 259,843	4,285 207,653	10,047 218,869	13,199 64,821
Lismore	R N	5,739 336,234	5,905 277,029	7,190 133,165	2,009 117,682	1,989 91,087	2,396 34,755
Cork	R N	10,859 144,422	8,624 150,674	17,317 60,730	3,801 50,548	2,896 48,754	5,685 15,249
Kerry	R N	9,996 308,825	43,086 260,042	33,876 186,355	3,499 108,089	14,383 84,531	10,919 46,768
Limerick	R N	24,512 374,065	28,927 381,489	28,412 280,373	8,579 130,923	9,341 120,984	8,970 71,629
Galway	R N	2,935 51,554	4,026 58,217	15,081 93,269	1,024 18,044	1,363 18,948	4,780 29,559
Connemara	R N	4,573 11,187	5,036 1,803	6,761 —	1,601 3,915	1,700 573	2,141 —
Ballinakill	R N	3,031 26,070	3,946 19,127	5,107 26,885	1,061 9,125	1,336 6,242	1,617 6,783
Bangor	R N	10,860 74,050	6,216 57,604	7,532 109,369	3,801 25,918	2,093 18,631	2,358 25,521
Ballina	R N	11,241 398,540	14,603 444,457	21,585 422,601	3,934 139,489	4,889 142,150	6,926 105,248
Sligo	R N	4,980 53,656	2,902 60,202	8,741 69,565	1,743 18,780	988 19,488	2,806 16,879
Ballyshannon	R N	3,660 278,549	9,003 183,047	6,711 159,259	1,281 97,492	3,022 59,012	2,108 39,270
Letterkenny	R N	19,145 583,550	8,229 518,238	15,158 437,097	6,701 204,243	2,764 168,383	3,271 108,171
Dundalk	R N	5,249 48,719	1,809 49,898	8,737 56,791	1,837 17,052	624 16,242	2,703 14,272
Drogheda	R N	1,989 59,389	7,094 70,722	20,762 110,238	696 20,786	2,386 22,928	8,373 27,768
TOTALS	...	3,510,748	3,403,849	2,702,248	1,228,762	1,107,788	699,428

* R indicates capture by means of single rod and line;
N by means of nets, weirs, etc.

APPENDIX No. 13

Quantity and Value of Sea Trout taken in 1968, 1969 and 1970 by Fishery Districts.

Fishery District	*	Quantity			Value		
		1970 lb.	1969 lb.	1968 lb.	1970 £	1969 £	1968 £
Dublin	R	1,265	3,512	413	316	659	61
	N	2,637	1,375	5,175	659	257	1,099
Wexford	R	1,977	2,087	2,304	494	392	457
	N	4,710	4,620	7,175	1,176	866	1,361
Waterford	R	1,703	6,704	876	426	1,259	151
	N	2,815	2,776	1,101	704	521	218
Lismore	R	2,204	2,186	1,379	551	411	249
	N	4,416	4,484	10,777	1,104	839	2,109
Cork	R	2,913	4,933	9,582	728	925	1,498
	N	3,589	3,624	978	897	680	192
Kerry	R	10,378	10,462	12,564	2,594	1,959	2,821
	N	687	4,582	613	172	860	134
Limerick	R	7,634	7,581	3,562	1,909	1,420	537
	N	6,997	7,248	24,037	1,749	1,358	4,294
Galway	R	2,894	3,487	1,338	724	645	230
	N	650	1,578	66	163	296	13
Connemara	R	5,671	3,798	9,796	1,418	713	1,836
	N	—	—	—	—	—	—
Ballinakill	R	2,929	2,892	5,518	732	542	880
	N	1,998	2,117	281	500	398	61
Bangor	R	3,901	3,859	6,082	975	723	963
	N	2,199	2,240	25	550	420	5
Ballina	R	3,671	3,758	4,691	918	705	827
	N	605	2,206	828	151	415	163
Sligo	R	800	751	657	200	142	125
	N	618	659	192	155	124	38
Ballyshannon	R	1,734	1,661	1,503	433	312	332
	N	7,003	7,216	53	1,750	1,352	11
Letterkenny	R	6,429	9,547	3,714	1,607	1,790	593
	N	2,817	2,743	1,689	704	515	338
Dundalk	R	2,183	2,062	2,112	546	390	349
	N	2,663	2,763	913	666	518	183
Drogheda	R	2,364	2,275	3,493	593	430	632
	N	1,897	5,486	1,192	474	1,028	222
TOTALS	...	106,951	127,272	124,679	26,738	23,864	22,982

* R indicates capture by means of single rod and line;
N by means of nets, weirs, etc.

APPENDIX No. 14

Quantity and Value of Eels taken in 1968, 1969 and 1970 by Fishery Districts.

Fishery District	Quantity			Value		
	1970 lb.	1969 lb.	1968 lb.	1970 £	1969 £	1968 £
Dublin	4,217	3,977	4,643	1,054	876	1,022
Wexford	12,174	11,283	24,830	3,043	2,065	4,743
Waterford	4,404	5,103	6,315	1,101	1,179	1,389
Cork	3,867	4,079	25,213	967	875	5,547
Kerry	900	442	17,817	225	96	2,600
Limerick	77,280	79,441	114,248	34,000	16,290	25,134
Galway	61,409	60,475	67,569	15,352	13,604	14,861
Ballina	18,721	21,387	13,117	4,680	4,472	2,887
Sligo	16,894	16,449	7,441	4,224	3,403	1,637
Ballyshannon	17,174	16,897	19,249	4,294	3,630	4,235
Dundalk	12,680	14,025	4,696	3,170	2,883	1,030
Drogheda	28,653	38,023	9,360	7,163	8,179	2,059
TOTALS	258,373	269,568	314,498	79,273	57,552	67,144

Note—The catch figures set out above are based on returns which are not complete. This explains any apparent inconsistency between the figures and the official export figures in any particular year.

APPENDIX No. 15

Total Quantity and Value of Salmon, Sea Trout and Eels taken by all Engines in 1968, 1969 and 1970 by Fishery Districts.

Fishery District	Total Weight for District			Total Value for District		
	1970 lb.	1969 lb.	1968 lb.	1970 £	1969 £	1968 £
Dublin ...	15,713	20,009	33,647	4,687	5,562	8,235
Wexford ...	48,899	40,574	64,292	15,226	10,698	14,991
Waterford ...	614,459	702,667	308,744	214,169	231,875	79,778
Lismore ...	348,593	289,604	152,511	121,346	94,326	39,509
Cork ...	165,650	171,934	113,820	56,941	54,130	28,171
Kerry ...	330,786	318,614	251,225	114,579	101,829	63,242
Limerick ...	490,488	503,224	450,632	177,160	149,393	110,564
Galway ...	119,442	127,783	177,323	35,307	34,856	49,443
Connemara ...	21,431	10,637	16,557	6,934	2,986	3,977
Ballinakill ...	34,028	28,082	37,791	11,418	8,518	9,341
Bangor ...	91,010	69,919	123,008	31,244	21,867	28,847
Ballina ...	432,778	486,267	462,822	149,172	152,631	116,051
Sligo ...	76,948	80,892	86,326	25,102	24,145	21,485
Ballyshannon ...	308,120	217,569	186,775	105,250	67,328	45,956
Letterkenny ...	611,941	538,757	457,658	213,255	173,452	112,373
Dundalk ...	71,494	70,557	73,249	23,271	20,657	18,537
Drogheda ...	94,292	123,600	145,045	29,712	34,951	39,054
TOTALS ...	3,876,072	3,800,689	3,141,425	1,334,773	1,189,204	789,554

APPENDIX No. 16

Number, Quantity and Value of Salmon taken by Single Rod and Line in 1968, 1969 and 1970 by Fishery Districts.

Fishery District	No. of Fish			Quantity			Value		
	1970	1969	1968	1970 lb.	1969 lb.	1968 lb.	1970 £	1969 £	1968 £
Dublin ...	200	124	480	1,957	982	3,437	685	348	1,356
Wexford ...	485	209	564	3,880	1,782	4,686	1,358	617	2,037
Waterford ...	1,512	3,762	5,256	12,243	30,078	40,609	4,285	10,047	13,199
Lismore ...	704	760	856	5,739	5,905	7,190	2,009	1,989	2,396
Cork ...	1,364	1,148	2,195	10,859	8,624	17,317	3,801	2,896	5,685
Kerry ...	1,277	5,868	4,839	9,996	43,086	33,876	3,499	14,383	10,919
Limerick ...	3,268	4,131	4,152	24,512	28,927	28,412	8,579	9,341	8,970
Galway ...	387	538	2,379	2,935	4,026	15,081	1,024	1,363	4,780
Connemara ...	618	716	1,096	4,573	5,036	6,761	1,601	1,700	2,141
Ballinakill ...	433	499	775	3,031	3,946	5,107	1,061	1,336	1,617
Bangor ...	1,511	784	1,069	10,860	6,216	7,532	3,801	2,093	2,358
Ballina ...	1,541	1,858	3,308	11,241	14,603	21,585	3,934	4,889	6,926
Sligo ...	600	384	1,124	4,980	2,902	8,471	1,743	988	2,806
Ballyshannon ...	475	1,189	869	3,660	9,003	6,711	1,281	3,022	2,108
Letterkenny ...	2,580	1,107	2,102	19,145	8,229	15,158	6,701	2,764	3,271
Dundalk ...	729	157	998	5,249	1,809	8,737	1,837	624	2,703
Drogheda ...	206	581	1,687	1,989	7,094	20,762	696	2,386	8,373
TOTALS ...	17,890	23,815	33,749	136,849	182,248	251,432	47,895	60,786	81,645

APPENDIX No. 17

Number, Quantity and Value of Sea Trout taken by Single Rod and Line in 1968, 1969 and 1970 by Fishery Districts.

Fishery District	No. of Fish			Quantity			Value		
	1970	1969	1968	1970 lb.	1969 lb.	1968 lb.	1970 £	1969 £	1968 £
Dublin	843	3,540	361	1,265	3,512	413	316	659	61
Wexford	1,318	2,115	2,511	1,977	2,087	2,304	494	392	457
Waterford	1,135	6,734	1,068	1,703	6,704	876	426	1,259	151
Lismore	1,469	2,216	1,815	2,204	2,186	1,379	551	411	249
Cork	1,945	4,960	11,947	2,913	4,933	9,582	728	925	1,498
Kerry	6,912	10,489	10,383	10,378	10,462	12,564	2,594	1,959	2,821
Limerick	5,090	7,610	3,910	7,634	7,581	3,562	1,909	1,420	537
Galway	1,929	3,514	1,235	2,894	3,487	1,338	724	645	230
Connemara	3,784	3,813	10,282	5,671	3,798	9,796	1,418	713	1,836
Ballinakill	1,953	2,920	5,168	2,929	2,892	5,518	732	542	880
Bangor	2,600	3,889	5,883	3,901	3,859	6,082	975	723	963
Ballina	2,447	3,785	4,501	3,671	3,758	4,691	918	705	827
Sligo	533	778	646	800	751	657	200	142	125
Ballyshannon	1,158	1,688	1,455	1,734	1,661	1,503	433	312	332
Letterkenny	4,286	9,575	3,698	6,429	9,547	3,714	1,607	1,790	593
Dundalk	1,455	2,089	1,986	2,183	2,062	2,112	546	390	349
Drogheda	1,576	2,302	3,331	2,364	2,275	3,493	593	430	632
TOTALS	40,433	72,017	70,180	60,650	71,555	69,584	26,738	13,417	12,541

APPENDIX No. 18

PARTICULARS OF RECEIPTS AND EXPENDITURE BY BOARDS OF CONSERVATORS
FOR THE YEAR ENDED 30th SEPTEMBER, 1970

Fishery District	Opening Balance	RECEIPTS					EXPENDITURE					Closing Balance
		Licence Duty	Fishery Rate	Grant from Dept.	Misc. Receipts	Total Receipts	Salaries	Water Keepers	Law Costs	Travel and Misc.	Total Expenditure	
	£	£	£	£	£	£	£	£	£	£	£	£
Dundalk	173	952	465	4,800	30	6,247	1,069	2,257	555	1,711	5,592	482
Drogheda	1,584	1,624	2,461	2,500	107	6,692	1,050	4,687	—	1,491	7,228	1,048
Dublin	285	1,800	347	2,900	324	5,371	2,243	998	392	1,763	5,396	260
Wexford	298	1,236	2,432	3,300	6	6,974	1,284	2,678	93	1,484	5,539	1,733
Waterford	3,252	1,142	2,397	10,000	267	13,806	2,493	10,695	475	4,874	18,537	1,479
Lismore	384	1,212	7,318	6,000	155	14,685	1,698	11,342	—	3,328	16,368	1,299
Cork	633	2,306	998	8,400	438	12,142	1,293	8,692	8	2,521	12,514	1,005
Kerry	1,550	3,289	4,974	4,800	303	13,366	1,051	9,353	281	3,059	13,744	1,928
Limerick	262	5,351	6,737	12,000	870	24,958	2,305	12,849	815	7,241	23,210	1,486
Galway	7,110	1,252	5,017	1,000	2,303	9,572	3,744	2,370	587	5,535	12,236	4,446
Connemara	333	792	2,409	—	15	3,216	1,869	1,929	2	1,040	4,840	1,291
Ballinakill	51	831	1,245	1,600	38	3,714	789	1,885	—	911	3,585	180
Bangor	255	1,516	2,257	4,200	583	8,556	4,586	1,597	231	1,898	8,312	499
Ballina	370	1,608	6,066	1,800	349	9,823	5,300	1,633	120	2,305	9,358	95
Sligo	503	647	2,219	2,500	223	5,589	1,871	1,733	56	1,075	4,735	1,357
Ballyshannon	226	1,952	852	3,000	4,000	9,804	1,323	6,065	—	2,389	9,777	253
Letterkenny	894	3,440	3,983	1,500	615	9,538	1,743	7,786	9	1,486	11,024	592
TOTALS	+ 12,187	30,950	52,177	70,300	10,626	164,053	35,711	88,549	3,624	44,111	171,995	+ 4,245

APPENDIX No. 19

PARTICULARS OF LICENCES ISSUED BY BOARDS OF CONSERVATORS FOR THE YEAR 1970

Fishery District	Salmon Rod										Special Local Licences (Tidal Waters)	Draft net	Drift net	Pole net	Bag net	Stake net	Head Weir	Box or Crib	Loop net	Snap net	Gap, Eye or Basket for eels	Long line for eels	Oyster Dredge	Eel Trap	Fyke nets and Baited Traps
	Annual (all districts)	Annual (district of issue)	Late Season (all districts)	Twenty-one day (all districts)	Seven day (all districts)	Late season (district of issue)	Foyle Area Extension (one district)	Foyle Area Extension (all districts)																	
Dublin	331	18	37	—	78	3	—	59	—	10	20	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Wexford	95	112	—	—	82	75	—	—	—	63	12	200	—	—	—	—	—	—	—	—	—	—	—	—	—
Waterford	147	661	6	—	131	46	—	—	—	9	75	30	—	—	—	—	—	—	—	—	—	—	—	—	—
Lismore	73	118	10	—	168	100	—	—	—	57	30	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cork	170	264	21	—	227	234	—	—	—	78	20	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Kerry	190	245	13	—	1,000	272	—	—	—	116	77	23	—	—	—	—	—	—	—	—	—	—	—	—	—
Limerick	237	751	15	—	202	33	—	—	—	12	25	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Galway	62	73	22	—	305	190	—	—	—	17	33	8	—	—	—	—	—	—	—	—	—	—	—	—	—
Connemara	10	12	11	—	358	64	—	—	—	11	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ballinakill	22	13	15	—	232	149	—	—	—	12	98	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Bangor	48	31	11	—	236	66	—	—	—	5	14	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ballina	52	176	14	—	147	17	—	—	—	12	98	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sligo	50	100	9	—	203	25	6	—	—	85	26	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ballyshannon	45	35	11	—	496	204	102	5	—	54	168	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Letterkenny	104	450	12	—	—	—	—	52	—	89	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Drogheda	196	87	6	—	39	53	—	—	—	37	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dundalk	65	85	10	—	24	80	2	10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TOTALS	1,897	3,231	223	1	4,218	1,611	110	126	29 rod 44 net	667	817	—	—	4	9	1	40	34	153	159	21	205	22	44	85

11,181
236
11,417

APPENDIX No. 20

Licence Duties Payable on Fishing Engines.

	£
On each Salmon Rod—Annual (valid all districts) ...	4.00
Do. Salmon Rod—Late Season (valid all districts) ...	3.00
Do. Salmon Rod—Twenty-one day (valid all districts) ...	3.00
Do. Salmon Rod—Seven day (valid all districts) ...	1.00
Do. Salmon Rod—Annual (valid district of issue only) ...	3.00
Do. Salmon Rod—Late Season (valid district of issue only) ...	2.00
Do. Salmon Rod—Foyle area extension (valid all districts) ...	2.50
Do. Salmon Rod—Foyle area extension (valid district of issue only) ...	1.50
On each Draft net ...	4.00
Do. Drift net ...	3.00
Do. Snap net ...	2.50
Do. Bag net ...	10.00
Do. Stake net ...	30.00
Do. Head Weir ...	6.00
Do. Box or Crib ...	10.00
Do. Pole net ...	2.00
Do. Loop net ...	0.50
Do. Gap, Eye, Basket or Coghill Net for Eels ...	2.00
Do. Long line for Eels ...	2.00
Do. Oyster fishing engine ...	2.00

LICENCE DUTIES PAYABLE ON FISHING ENGINES OTHER THAN THOSE MENTIONED ABOVE.

Fishery District	Fyke Net (provisional rates)	Eel Trap	Special Local Licences	
			Rod	Draft Net
	£	£	£	£
1. Dublin	0.25	—	—	—
2. Wexford	0.25	2.00	—	—
3. Waterford	0.25	—	—	—
4. Lismore	—	—	—	—
5. Cork	—	—	—	—
7. Kerry	0.25	—	—	—
8. Limerick	—	—	—	—
91. Galway	2.00	2.00	—	—
92. Connemara	—	—	—	—
101. Ballinakill	—	—	—	—
102. Bangor	—	—	\$3.00	\$25.00
11. Ballina	—	—	—	—
12. Sligo	—	—	—	—
13. Ballyshannon	—	—	—	*40.00
141. Letterkenny	—	—	†3.00	†20.00
171. Drogheda	—	2.00	—	—
172. Dundalk	—	2.00	—	—

† River Lackagh Tidal Waters.
* River Erne Tidal Waters.

† River Owenea Tidal Waters.
§ Owenmore/Owenduff Tidal Waters.

APPENDIX No. 21

PARTICULARS OF PUBLIC INQUIRIES HELD DURING 1970

Date of Inquiry	Where held	Subject Matter	Decision on Report of Inquiry
4th March, 1970	Cork	Application of Atlantic Shellfish Ltd., Rossmore, Carrigtwohill, Co. Cork, for an oyster fishery order.	Order Granted.
9th April, 1970	Kinvara, Co. Galway	Application of Mr. Emmet McNamara, Muckinish Castle, Ballyvaughan, Co. Clare, for an oyster fishery licence.	Licence Granted.
21st May, 1970	Skibbereen, Co. Cork	Application of Atlantic Shellfish Ltd., Rossmore, Carrigtwohill, Co. Cork, for an oyster fishery order.	Order Granted.
17th June, 1970	Kinsale, Co. Cork	Application of Experimental Fisheries Ltd., 1, Pope's Road, Cork, for a Mussel fishery Order.	Order Granted.
29th July, 1970	Galway	Regulation of Public Oyster fishery in Galway Bay.	Under consideration.

60

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APPENDIX No. 22

ABSTRACT OF STATUTORY INSTRUMENTS MADE IN 1970

GENERAL

An tOrdu Iascaigh (Feidhmeanna Aire a Tharmligean), 1970 (I.R. Uimh. 123 de 1970) deinte ag an Rialtas 28 Bealtaine, 1970.

Ag Tarmligean chun Rúnaí Parlaiminte Aire Talmhaíochta agus Iascaigh cumhachtaí agus dualgais an Aire Talmhaíochta agus Iascaigh maidir le hiascach.

Bass Fishing Conservation Bye-Law No. 550, 1970, dated 29th July, 1970.

Prescribing for a period of five years a size limit for bass, and a weekly close time for commercial fishing; and **Prohibiting** fishing for bass with nets in certain waters off Co. Cork.

Control of Fishing For Salmon At Sea Order, 1970 (S.I. No. 309 of 1970) dated 22nd December, 1970.

Implementing a recommendation of the North-East Atlantic Fisheries Commission for the regulation of fishing for salmon outside national fishery limits of Member States.

LOCAL

Lismore District Close Season Bye-Law No. C.S. 116, 1970, dated 15th January, 1970.

Altering the annual close season for the taking of salmon by nets in the Lismore District.

Waterford District Close Season Bye-Law No. C.S. 117, 1970, dated 15th January, 1970.

Altering the annual close season for netting for salmon and for salmon angling in the Waterford District.

River Feale (Angling) Bye-Law No. 549, 1970, dated 20th January, 1970.

Prohibiting angling for salmon or trout in a specified portion of the River Feale with any lure other than artificial fly.

Mouths Of The Rivers Galey or Geale And Brick Definition No. D. 148, dated 28th January, 1970.

Redefining the points of the mouths of the Rivers Galey or Geale and Brick in the Limerick District.

Oyster Fishery (Baltimore Harbour and River Ilan) Order, 1967 (Determination) Order, 1970, dated 3rd February, 1970.

Determining the Oyster Fishery (Baltimore Harbour and River Ilan) Order, 1967.

Oyster Fishery (Valencia River and Derreen River) Order, 1968 (Determination) Order, 1970, dated 3rd February, 1970.

Determining the Oyster Fishery (Valencia River and Derreen River) Order, 1968.

Oyster Fishery (Baltimore Harbour and River Ilan) Order, 1970, dated 31st December, 1970.

Granting to Atlantic Shellfish Limited, Rossmore, Carrigtwohill, Co. Cork the exclusive right of operating an oyster fishery in the waters described in the Schedule to the Order.

Fishery Harbour Centre (Castletownbere) Order, 1970 (S.I. No. 57 of 1970) dated 23rd March, 1970.

Declaring and Defining the area of Castletownbere Fishery Harbour Centre.

Oyster Fishery (Oyster Haven) Order, 1970, dated 24th March, 1970.

Granting to Experimental Fisheries Limited, 1, Pope's Road, Cork the exclusive right of operating an oyster fishery in the waters described in the Schedule to the order.

Killybegs Pier and Harbour (Amendment) Order, 1970 (S.I. No. 90 of 1970), dated 28th April, 1970.

Extending the application of the Killybegs Pier and Harbour Order, 1896, to the whole of the Killybegs Fishery Harbour Centre.

Licence to Form or Plant an Oyster Bed No. 189, dated 1st September, 1970.

Granting to Dr. K. Hickey of 22, John's Hill, Waterford, a licence to form or plant an oyster bed in the waters described in the licence.

Licence to Form or Plant an Oyster Bed No. 190, dated 2nd November, 1970.

Granting to Mr. Emmet McNamara, Muckinish Castle, Ballyvaughan, Co. Clare, a licence to form or plant on oyster bed in the waters described in the licence.

Oyster Fishery (Cork Harbour) Order, 1970, dated 5th November, 1970.

Granting to Atlantic Shellfish Ltd., Rossmore, Carrigtwohill, Co. Cork the exclusive right of operating an oyster fishery in the waters described in the Schedule to the Order.

Mussel Fishery (Oyster Haven) Order, 1970, dated 23rd November, 1970.

Granting to Experimental Fisheries Limited, 1, Pope's Road, Cork, the exclusive right of operating a mussel fishery in the waters described in the Schedule to the Order.

FOYLE AREA

Regulations Made By The Foyle Fisheries Commission With The Approval Of The Minister For Agriculture And Fisheries And The Ministry Of Agriculture For Northern Ireland.

Foyle Area (Close Seasons For Angling) Regulations, 1970.

Extending the angling season on the Rivers Cudaff and Deelee.

Foyle Area (Weekly Close Time) Regulations, 1970.

Extending the 60 hour weekly close time during which period netting is prohibited to the tidal waters of the River Roe, in addition to the tidal waters of the River Foyle and Lough Foyle.

Foyle Area (Control Of Netting) (Amendment) Regulations, 1970.

Amending the Foyle Area (Control of Netting) Regulations, 1966 to conform with the revised Weekly Close Time Regulations.

APPENDIX No. 23

Distribution of Fish Hatchery Produce, 1969/70

Hatchery	River system stocked	Salmon 1,000	Sea Trout 1,000	Brown Trout 1,000
Parteen ...	Rivers Maigue, tributaries of Newport and Mulcaire Rivers, River Suck and tributaries, River Nenagh, Little Brosna and tributaries.	1,143	—	—
Lee	Rivers Bride, Shournagh and Sheep.	220	—	—
Fanure ...	Various Trust waters in Cos. Longford, Monaghan, Westmeath, Sligo, Offaly, Cork, Kerry and Clare.	—	—	Fry 236 Summerling 348 Fingerling 323 Yearling 20 Adult 6
Mullingar	Various Trust waters in Cos. Westmeath, Cavan and Longford.	—	—	Fry 1,180 Summerling 132 Fingerling 516 Yearling 14
Clooncrim	Various Trust waters in Cos. Westmeath, Roscommon and Sligo.	—	—	Fry 190 Fingerling 19
Mallow	River Blackwater and tributaries.	650	—	—
Screebe	560,000 ova for restocking diseased rivers as follows: River Barrow 100,000 River Maigue 100,000 Feale System 100,000 Cummeragh River System 50,000 River Blackwater 50,000 River Arrow 150,000 River Bonet 10,000 Remainder to the Screebe System.	762	—	—
Cong ...	Reared to the underyearling stage and distributed as follows:— (a) River Moy and tributaries 60,000 (b) River Deel 20,000 Remainder to the Corrib System.	193	—	—
Glenties ...	50,000 to Foyle System 120,000 to Waters under Control of E.S.B. 130,000 Rivers Erne and Duff Remainder to the Owenea System. Sea Trout ova were distributed to Rivers in Kenmare district.	360	14	—
Burrishoole Fishery I. (operated by Salmon Research Trust)	Produce used for research purposes.	51	—	—

Hatchery	River system stocked	Salmon 1,000	Sea Trout 1,000	Brown Trout 1,000
Burrishoole Fishery II.	593,000 ova for restocking diseased rivers as follows: Rivers Slaney and Barrow 100,000 Rivers Blackwater-Lismore 82,000 Rivers in Cork Fishery District 50,000 River Cummeragh 50,000 Rivers Sheen and Blackwater 80,000 Waters under control of E.S.B. 81,000 Rivers Easkey and Palmers-ton 50,000 River Foyle System 100,000	593	—	—

APPENDIX No. 24

SCIENTIFIC AND OTHER PAPERS, 1970

A. DEPARTMENTAL

i. BULLETINS.

- (a) Sea Fisheries No. 7 and
- (b) Inland Fisheries No. 7, giving details of work in 1969.

ii. FISHERY LEAFLETS.

- No. 15. M. L. Crowley. The edible mussel *Mytilus edulis*.
- No. 16. J. P. Molloy. The herring fisheries of Ireland.
- No. 17. F. A. Gibson. The Irish Shellfish Industry. (Published in 1969).
- No. 18. J. P. Molloy. Crawfish investigations, 1966-68.
- No. 19. J. P. Molloy. South coast (Waterford and Cork) herring fishery, 1969-70.
- No. 20. T. D. Kennedy. Herring investigations in the north-west coast, 1969 and 1970.
- No. 21. C. I. D. Moriarty. Eel research in 1969.
- No. 22. J. P. Hillis. Studies on Dublin Bay Prawns (*Nephrops norvegicus*) in the Irish Sea.
- No. 23. F. A. Gibson. Lobster Trap census, 1969.
- No. 24. F. A. Gibson and C. B. Duggan. Experiments with the American Hard-shelled Clam (*Mercenaria mercenaria*) 1969.

B. OTHERS

- J. T. Carbery. Correlation between total serum protein and albumin/globulin ratio in malnourished brown trout. *Vet. Rec.* 87. 175.

Observations on blood parameters of brown trout with Ulcerative Dermal Necrosis. *Res. vet. Sci.* 11. 491-493.

- A. E. J. Went. Interesting fish from Irish waters in 1969. *Irish Nat. J.* 16. 294-298.

Notes on salmon of the River Foyle (1969). 18 *Rep. Foyle Fish. Com. App. IV.*

Ulcerative dermal necrosis in the Republic of Ireland in 1969. *Salmon and Trout Mag.* No. 188. March 1970.

Report on the Anadromous and Catadromous Fish Committee of ICES. *Salmon and Trout Mag.* No. 189. July, 1970.

Salmon movements around Ireland. *Berichte der Deutschen wissenschaftlichen Kommission für Meeresforschung.* Bd. 21. (1970). H 1-4. S. 33-45.

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